U.S. Biol. Survey

WILDLIFE REVIEW

OHIO STATE UNIVERSITY
AUG 27 1953
LIBRARY

NUMBER 73 JUNE 1953

UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

WILDLIFE REVIEW

An abstracting service for wildlife management
Issued for the information of cooperators
by the Fish and Wildlife Service
United States Department of the Interior

June 1953 Patuxent Research Refuge, Laurel, Maryland No. 73

CONTENTS

	Page
Wildlife	
Bibliography, biography, history	2
Education	3
Techniques	3
Biometrics	5
Economic and other values	7
Foods	8
Natural areas	8
Morphology, physiology, behavior, migration	8
Biotas, communities, general ecology	9
Numbers and number fluctuations	10
Parasites and diseases	10
Mortality from insecticides, weather, cars, etc.	10
Management	
General	12
Harvests and hunting	17
Farm	18
Forest and range	19
Wet-land	21
Predation, crop damage, and control	22
Reports of organizations	24
Mammals	
General	28
Faunas and manuals	29
Communities, numbers, home ranges	30
Parasites and diseases	31
Control, mortality	32
Shrews, moles, bats	32
Rabbits and pikas	32
Rodents	
Miscellaneous	33
House rats and mice	35
Sciurids	36
Beaver	37
Muskrat and nutria	38
Furbearers--General	39
Mammals--Continued	
Carnivores	
Bears	39
Raccoon and ringtail	39
Mustelids	40
Dogs, wolves, foxes	41
Cats	42
Big game	
General	42
Hoofed (except deer)	43
Deer	45
Marine	50
Birds	
General	52
Morphology, physiology, behavior, migration	53
Manuals, faunas, communities	56
Numbers and number fluctuations	57
Parasites and diseases	57
Upland game	
General	58
Quail	59
Pheasants	61
Grouse, partridge, etc.	63
Turkey	64
Doves and pigeons	65
Waterfowl	66
Cranes, rails, shorebirds	71
Other birds	72
Reptiles and amphibians	74
Fishes	76
Invertebrates	77
Vegetation	
General, ecology, control, techniques	77
Floras and communities	78
Forest	79
Pasture and range	82
Wet-land	83
Land, soils, water, and climate	83
Availability of papers	86
Author index	87

Except as indicated, abstracts are by William H. Stickel, editor.

"The printing of this publication has been approved
by the Director of the Bureau of the Budget, August 19, 1952."

WILDLIFE--BIBLIOGRAPHY, BIOGRAPHY, HISTORY

Anonymous. PUBLICATIONS OF THE IOWA COOPERATIVE WILDLIFE AND FISHERIES RESEARCH UNITS. Department of Zoology and Entomology, Iowa State College, Ames. 1-36 p., mimeo. Jan. 1953.
Publications are fully cited and are classified by subject. Availability of reprints is not indicated.

Cottam, Clarence. FIFTY YEARS OF PROGRESS AND HANDICAPS IN WILDLIFE MANAGEMENT IN THE UNITED STATES. 41st Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 10-11, 1951, Rochester, N. Y. 93-106 p. 1951.
Achievements, changes, and needs.

Leedy, Daniel L. BIOLOGISTS IN THE FIELD OF WILDLIFE CONSERVATION. A.I.B.S. Bulletin 3(2): 21-23. April 1953.
Sketch of history of wildlife profession in this country, and resumé of present status of training and employment. Importance of graduate training is emphasized.

Lewis, Harrison F. FIFTY YEARS OF PROGRESS AND HANDICAPS IN WILDLIFE MANAGEMENT IN CANADA. 41st Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 10-11, 1951, Rochester, N. Y. 85-92 p. 1951.
Summarizes accomplishments and lists handicaps that still exist.

Library, U. S. Department of Interior. AQUATIC BIOLOGY AND OCEANOGRAPHY, A SELECTED LIST OF BOOKS, COMPILED IN THE LIBRARY. U. S. Fish & Wildlife Service, Fishery Leaflet 162. 12 p. Revised Nov. 1952.

Royal Ontario Museum of Zoology and Palaeontology. LIST OF PUBLICATIONS. Toronto. 1-7 p. 1952-1953.
Gives full citations; states prices of items still in print.

Smith, Malcolm, editor. THE ZOOLOGICAL RECORD, VOLUME THE EIGHTY-SIXTH BEING THE RECORDS OF ZOOLOGICAL LITERATURE RELATING CHIEFLY TO THE YEAR 1949. Zoological Society of London (Regent's Park, London). 1952.
The sections of this outstanding bibliographic tool can be purchased separately. Sizes and prices of the vertebrate sections are: Pisces, 80 p., 7s. Amphibia and reptilia, 117 p., 7s. 6d. Aves, 78 p., 7s. 6d. Mammalia, 94 p., 7s. 6d. Titles of each section are listed alphabetically by author but cross-indexed by subject. Sample subject headings under Mammalia: dentition, endocrine glands, longevity, pathology, oestrous and sex cycles, genetics, population studies, migration and homing, conservation, extermination, naturalization, hibernation, economics, distribution and faunas, Canidae, Mustelidae, Bovidae.

U. S. Fish and Wildlife Service. AVAILABLE PUBLICATIONS ON WILDLIFE. Wildlife Leaflet 186. 1-4 p. Revised Sept. 1952.
Lists all Service publications now available from the Service itself or from the Superintendent of Documents.

Witthoft, John. THE AMERICAN INDIAN--HUNTER. Pennsylvania Game News 24(4): 8-13, illus. April 1953.
Last of 3 parts that appeared consecutively in same journal. The series was written by an expert and contains much information on beliefs and practices of Indians of northeastern U. S. Hunting methods are stressed less than are the underlying traditions.

WILDLIFE--EDUCATION

Collins, Stephen. HUNTERS AND HUNTED. Canadian Wildlife Service, Ottawa. 19 p., illus. 1952. [From review by A. W. Cameron, Canadian Field-Naturalist 66(5).]

Pamphlet on predator-prey relationships for information of "intermediate and senior grade" students. Said to present a clear picture showing that predators are ecologically important and that their predation is often of value to man as well as to prey populations.

Eschmeyer, R. W. MAC MALLARD. AL ALLIGATOR. WOODY WOODCOCK. Each illus. Fisherman Press, Oxford, Ohio. Paper covers, 50¢ each; cloth, $1.00 each.

Three more of Eschmeyer's wildlife biography and management booklets for children. For previous titles see WR 70:2.

Harkness, W. J. K. TRAINING IN CANADA IN THE WILDLIFE FIELD. 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952, Dallas, Texas. 39-43 p. 1952.

Hoff, Clayton M. EFFECTIVE CONSERVATION EDUCATION PROGRAMS. 41st Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 10-11, 1951, Rochester, N. Y. 155-161 p. 1951.

A leader of the Brandywine Valley Association tells of the diversified yet integrated activities of that Association and outlines the demonstration, participation, and other educational approaches employed.

Jordan, E. L. HAMMOND'S NATURE ATLAS OF AMERICA. C. S. Hammond & Co., Maplewood, N. J. 1-256 p., illus. 1952.

Like most popular works of broad scope, this attractive book is of little use for reference, but it should be of inspirational value in grade and high school libraries. The bulk of the book treats a sampling of common or important rocks, plants and animals, with a paragraph, colored drawing, and generalized range map for each species included. The sampling, of course, is thin: 1 ant, 1 wasp, 1 rattlesnake, 1 thrush, etc. Most large mammals are represented, but few game birds. Maps show locations of national parks, forests, refuges, and Indian reservations. Brief notes are given on many of these areas. Five pages are devoted to a list (by states) of federal wildlife refuges, their sizes and chief animals.

Moore, Velma Beam. HOW TO SELL A COORDINATED NATURAL RESOURCES PROGRAM TO THE PUBLIC. 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952, Dallas, Texas. 51-56 p. 1952.

Seagears, Clayton B. THE STORY OF CONSERVATION IN NEW YORK. Cornell Rural School Leaflet 46(2): 1-32, illus. Fall 1952.

Slightly revised edition of 1946 leaflet. Popular, humorous presentation of many aspects of conservation for grade school children. Text is enlivened by numerous cartoons, changes of format, etc.

Solman, Victor E. F. OUR URGENT NEED: A CONSERVATION-MINDED PUBLIC. 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952, Dallas, Texas. 108-111 p. 1952.

WILDLIFE--TECHNIQUES

Ginn, Wm. E. THE RURAL MAIL CARRIER'S SURVEY OF WILDLIFE POPULATIONS. Presented at 14th Midwest Wildlife Conference, Des Moines, Iowa, Dec. 17-19, 1952. 1-5 p. 1952.

Which midwestern states use these surveys, how mailmen are reached, what species are surveyed and how often, and what values are placed on such surveys. The method is economical, yields useful data on distribution and to some degree on trends, and has public relations value. It is not reliable for limited areas, or at all seasons.

WILDLIFE--TECHNIQUES--Continued

Harned, B. K., R. W. Cunningham, and E. R. Gill. AN ACTIVITY ANALYZER FOR SMALL ANIMALS. Science 116(3014): 369-370, illus. Oct. 3, 1952.
Improved activity cage with kymograph recorder.

Heath, G. R. SIMPLE DEVICES AID USE OF AERIAL PHOTOGRAPHS. Journal of Forestry 51(2): 125-126, illus. Feb. 1953.
Magnifying mirror stereoscope, binocular stereoscope, and plotting machine that a forester can construct for himself. Comments by R. N. Colwell follow Heath's article.

Leedy, Daniel L. AERIAL PHOTO USE AND INTERPRETATION IN THE FIELDS OF WILDLIFE AND RECREATION. Photogrammetric Engineering 19(1): 127-137, illus. March 1953.
Uses of aerial photos as maps and in game censuses are described. Special techniques for interpreting and using these photographs for wildlife purposes are discussed. The value of stereoscopic examination is stressed. Aerial photos might well be used more widely than they now are. Some suggested uses include: locating game management areas, wildlife problem areas and potential dam sites; law enforcement; studying areas damaged by fire, floods, insects or disease; determining hunting and fishing pressure; determining changes in vegetative cover and land use over a period of years; making special studies of rare or vanishing species in which permanent pictorial records of habitat types are desirable; and conducting lake and stream surveys. Twenty four references.

Moessner, Karl E. AN AERIAL PHOTO SCALE-PROTRACTOR. U. S. Forest Service, Central States Forest Experiment Station (Columbus 15, Ohio), Station Notes no. 74. 1-2 p., illus. April 1953.
"The aerial photo scale previously described has been combined with a small protractor suitable for use on aerial photos. Using this combination the photo interpreter can (a) determine the approximate scale of his photos, (b) measure distances and angles on the photos, and (c) visualize the size of a 1/5-acre or 1-acre plot on photos of various scales." Note does not state where instrument may be purchased, and construction at home does not appear feasible.

Overton, W. Scott, Jr. SOME DEVELOPMENTS IN THE FIELD BAG CHECK SYSTEM OF COLLECTING HUNTING STATISTICS. Presented at 6th Annual Conference, Southeastern Association of Game and Fish Commissioners, Oct. 19-22, 1952, Savannah, Ga. 1-13 p. [Available from J. H. Jenkins, U. of Ga., Athens.]
On the basis of Florida experience, formulas are proposed for estimation of total kill from bag-check data. Corrections and assumptions involved are analyzed. The system proposed differs significantly from similar systems.

Robinson, J. M. THE DOT-READING OVERLAY FOR THE MEASUREMENT OF MAP AREAS. Canada Department of Resources and Development, Forestry Branch (Ottawa), Forest Inventories (Forest Air Survey), Publication no. 8. 2 p. Date not stated in following source. [From Journal of Forestry 51(4).]

Wilson, H. Lee and Edward V. Berard. AUTUMN COLORS, AN AID TO WILDLIFE COVER MAPPING. Journal of Wildlife Management 17(1): 98-99. Jan. 1953.
Tabulates color and other characteristics of 20 trees and shrubs that facilitate long distance type-mapping in West Virginia.

Yeager, Lee E. "BONE BOARD" FOR BIG-GAME FIELD WORKERS. Journal of Wildlife Management 17(2): 223-224, illus. April 1953.
Describes board on which selected bones of various species are mounted for field identification of remains. Eight by ten inch photographs of the preparation can be used.

WILDLIFE--BIOMETRICS [Most of the entries from Biometrika have been supplied by Dr. Vincent Schultz, who has gone through all issues to locate titles of special interest to wildlife or fisheries biologists.]

Bailey, Norman T. J. ON ESTIMATING THE SIZE OF MOBILE POPULATIONS FROM RECAPTURE DATA. Biometrika 38: 293-306. 1951.

Beall, Geoffrey. METHODS OF ESTIMATING THE POPULATION OF INSECTS IN A FIELD. Biometrika 30: 422-439. June 1938-Jan. 1939.

Chapman, Douglas G. INVERSE, MULTIPLE AND SEQUENTIAL SAMPLE CENSUSES. Biometrics 8(4): 286-306. Dec. 1952.
Extensive article on the mathematics of enumeration of populations by the tagging and recapture method. A much needed addition to the field of wildlife population censuses.--Vincent Schultz.

Cox, E. L. MATHEMATICAL BASES OF EXPERIMENTAL SAMPLING FOR ESTIMATION OF SIZE OF CERTAIN BIOLOGICAL POPULATIONS. Agricultural Experiment Station, Blacksburg, Virginia. Statistical Laboratory Report. 42 p., mimeo. June 1949.
Deals primarily with fish, but the mathematics apply to studies of other wildlife. Section headings include: "Simple angling with marking. Capture of fixed size groups with marking. Netting with marking. Simple angling with tagging."--Vincent Schultz.

Geis, Aelred D. A METHOD FOR ESTIMATING ADEQUATE SAMPLE SIZE AND CONFIDENCE LIMITS FOR STRIP CENSUS DATA. Presented at 14th Midwest Wildlife Conference, Des Moines, Iowa, Dec. 17-19, 1952. 1-10 p. + graph. 1952.
Discusses statistical methods for attacking problems mentioned in title. Examples are taken from studies of Gambels' quail and scaled quail in Arizona and pheasants in Michigan, but the methods have potentially wide application.

Gordon, Robert D. ESTIMATING BACTERIAL POPULATIONS BY THE DILUTION METHOD. Biometrika 31: 167-180. July 1939-Mar. 1940.

Grundy, P. M. THE EXPECTED FREQUENCIES IN A SAMPLE OF AN ANIMAL POPULATION IN WHICH THE ABUNDANCES OF SPECIES ARE LOG-NORMALLY DISTRIBUTED. PART I. Biometrika 38: 427-434. 1951.

Hacker, H. P. and H. S. Pearson. THE GROWTH, SURVIVAL, WANDERING AND VARIATION OF THE LONG-TAILED FIELD MOUSE, APODEMUS SYLVATICUS. III. WANDERING AND DISTRIBUTION. Biometrika 39: 389-413. 1952.

Jenkinson, J. W. GROWTH, VARIABILITY AND CORRELATION IN YOUNG TROUT. Biometrika 8: 444-455. July 1911-Jan. 1912.

Kelker, George Hills. SEX AND AGE CLASS RATIOS AMONG VERTEBRATE POPULATIONS. Proceedings of Utah Academy of Sciences, Arts and Letters 27: 12-21. 1949-50.
Designed to aid in and extend analysis of data from bag checks, this paper merits careful attention from all concerned with such work. It presents a number of equations pertaining to removal and survival and tells how to correlate field and bag observations.

Latter, Oswald H. THE EGG OF CUCULUS CANORUS. Biometrika 1: 164-176. Oct. 1901-Aug. 1902.

Latter, Oswald H. THE EGG OF CUCULUS CANORUS (Second Memoir). Biometrika 4: 363-373. June 1905-Mar. 1906.

Leslie, P. H. ON THE USE OF MATRICES IN CERTAIN POPULATION MATHEMATICS. Biometrika 33: 183-212. Apr. 1943-June 1946.

Leslie, P. H. SOME FURTHER NOTES ON THE USE OF MATRICES IN POPULATION MATHEMATICS. Biometrika 35: 213-245. 1948.

WILDLIFE--BIOMETRICS--Continued

Leslie, P. H. and Dennis Chitty. THE ESTIMATION OF POPULATION DATA OBTAINED BY MEANS OF THE CAPTURE-RECAPTURE METHOD. I. THE MAXIMUM LIKELIHOOD EQUATIONS FOR ESTIMATING THE DEATH-RATE. Biometrika 38: 269-292. 1951.

Leslie, P. H. THE ESTIMATION OF POPULATION PARAMETERS FROM DATA OBTAINED BY MEANS OF THE CAPTURE RECAPTURE METHOD. II. THE ESTIMATION OF TOTAL NUMBERS. Biometrika 39(3-4): 363-388. Dec. 1952.
A statistical work that provides formulas for estimation of total numbers (1) when death-rate is assumed to remain constant but dilution of population is occurring, (2) when no dilution is occurring and death-rate is changing, (3) when only 2 parameters are needed to describe the population, and (4) when dilution is occurring, and death-rate is varying both in time and between different groups of animals. Death-rate, as used here, includes emigration.

Moran, P. A. P. A MATHEMATICAL THEORY OF ANIMAL TRAPPING. Biometrika 38: 307-311. 1951.

Moran, P. A. P. THE ESTIMATION OF DEATH-RATES FROM CAPTURE-MARK-RECAPTURE SAMPLING. Biometrika 39: 181-199. 1952.

Opinion Research Center, University of Denver. CALIFORNIA FISH AND GAME SURVEY -- SUMMARY REPORT OF PILOT STUDY CONDUCTED IN THE SAN FRANCISCO BAY AREA, NOVEMBER 17-24, 1948. 32 p., mimeo. 1949.
Report of pilot survey for personal interview surveys of angling and hunting licensees. Of special interest to survey planners. Availability of copies is similar to that of the definitive report, which is described in next entry.--Vincent Schultz.

Opinion Research Center, University of Denver. HUNTING IN CALIFORNIA -- 1948. Report of a survey conducted for the Division of Fish and Game, State of California. 110 p. plus enclosures. Mimeo. 1952.
Undoubtedly this study is the most complete and "statistically sound" of its type. The Opinion Research Center conducted two personal interview surveys of angling and hunting licensees in California. Results of hunting licensee interviews are presented in this report in two parts: Part I, Hunting Success and Attitude of Hunting Licensees; and Part II, County Data and Analysis of Hunter's Attitudes. The report also includes questionnaires, interviewer instructions, and a discussion of sampling procedures. A comparison is made of the personal interview and postal card method of obtaining game kill information. A portion of this report has been published by Hjersman, 1951 [Calif. Fish and Game 37(1): 77-95.]. The report should be of much value to persons dealing with hunter attitude and kill. It includes many observations of interest even to persons not concerned with survey procedures. Unfortunately, distribution of this report has been very limited. The California Division of Fish and Game has a few copies for intradepartmental use, the reviewer has a copy, and the "Records Division" of the University of Denver probably has a few copies, as the now non-existant Opinion Research Center turned their copies over to this Division.--Vincent Schultz.

Pearson, Karl. VARIATION OF THE EGG OF THE SPARROW (PASSER DOMESTICUS). Biometrika 1: 256-257. Oct. 1901-Aug. 1902.

Pearson, Karl. ON THE CURVES WHICH ARE MOST SUITABLE FOR DESCRIBING THE FREQUENCY OF RANDOM SAMPLES OF A POPULATION. Biometrika 5: 172-175. Oct. 1906-June 1907.

Pearson, Karl. ON A METHOD OF ASCERTAINING LIMITS TO THE ACTUAL NUMBER OF MARKED MEMBERS IN A POPULATION OF GIVEN SIZE FROM A SAMPLE. Biometrika 20(a): 149-174. 1928.

Perrin, Emily. ON SOME DANGERS OF EXTRAPOLATION. Biometrika 3: 99-103. Jan. 1904-Dec. 1904.

WILDLIFE--BIOMETRICS--Continued

Rendel, J. M. VARIATIONS IN THE WEIGHTS OF HATCHED AND UNHATCHED DUCK'S EGGS. Biometrika 33: 48-58. Apr. 1943-June 1946.

Robson, Douglas S. INTERVAL ESTIMATION OF FISH POPULATIONS BY MEANS OF MARKED MEMBERS. [Abstract only.] Biometrics 8(4): 391. Dec. 1952.
An addition to the field of population enumeration.--Vincent Schultz.

Rowan, William, K. M. Parker, and Julia Bell. ON HOMOTYPOSIS AND ALLIED CHARACTERS IN EGGS OF THE COMMON TERN. Biometrika 10: 144-168. Apr. 1914-May 1915.

Rowan, W., E. Wolff, P. L. Sulman (field workers); K. Pearson (reporter); E. Isaacs, E. M. Elderton, and M. Tildesley (tabulators & computers). ON THE NEST AND EGGS OF THE COMMON TERN (S. FLUVIATILIS). A COOPERATIVE STUDY. Biometrika 12: 308-354. Nov. 1918-Dec. 1919.

Skellam, J. G. STUDIES IN STATISTICAL ECOLOGY. I. SPATIAL PATTERN. Biometrika 39: 346-362. 1952.

Thomas, Marjorie. A GENERALIZATION OF POISSON'S BINOMIAL LIMIT FOR USE IN ECOLOGY. Biometrika 36: 18-25. 1949.

Watson, D. M. S., N. M. Watson, H. S. Pearson, M. N. Karn (field workers); J. O. Irwin, and Karl Pearson (computors and reporters). ON THE NEST AND EGGS OF THE COMMON TERN (S. FLUVIATILIS). A THIRD COOPERATIVE STUDY. Biometrika 15: 294-345. 1923.

Wing, Leonard W. CYCLES OF LYNX ABUNDANCE. Journal of Cycle Research 2(2): 28-51, graphs. Spring 1953.
A long and technical paper on mathematical methods of handling data on cycles. "It has been written with two purposes in mind: (a) to report on a partial study of Lynx cycles and (b) to furnish a 'primer' of analytical methods that others may find useful in studying their own data for cycles." Author's conclusions: "An index of Lynx...abundance has a rhythm with wave length varying from about 6 to 11 years. When subjected to cycle analysis the index shows a dominant (alpha) cycle with an average length of 9.6 years and with an average amplitude of 257.0% of trend at its high and 38.9% of trend at its lows. The cycle indicated as probably the beta cycle has an average length of 35.2 years and average amplitude of 144.5% of trend at its highs and 69.2% of trend at its lows. A cycle designated as probably the gamma cycle has an average length of 22.2 years with an average amplitude of 138.0% of trend at its highs and 72.4% of trend at its lows. Five other cycles with average lengths of 7.46, 7.95, 9.0, 11.75, and 15.05 years are isolated and measured. The analysis indicates also the presence of a number of additional cycles."

WILDLIFE--ECONOMIC AND OTHER VALUES

Anonymous. [ECONOMICS OF CALIFORNIA'S 1951 GAME BAG.] Outdoor California 14(3): 1-2. Jan. 21, 1953.
California Department of Fish and Game estimates that game bagged in the state in 1951 was worth at least $15,000,000 and caused hunter expenditures of about $50,000,000. Value of meat was figured at 75¢ per dressed pound. Numbers and weights used in the estimation are explained.

White, Claude E., and R. F. Gregg. THE BIG PAYOFF. Colorado Conservation 2(3): 24-26. May-June 1953.
Estimates are made of cash values derived in different ways from Colorado's annual fish and game crop. "Add it all together and very likely the total volume of wildlife-supported business will reach 100 million dollars! ...It can no longer be assumed that wildlife must always give way to 'civilized' industries. There's a good chance that, matching dollar for dollar, much of Colorado's land and water is most valuable as habitat for game and fish."

WILDLIFE--FOODS

Stollberg, Bruce P., and Ruth L. Hine. FOOD HABIT STUDIES OF RUFFED GROUSE, PHEASANT, QUAIL AND MINK IN WISCONSIN. Wisconsin Conservation Department, Technical Wildlife Bulletin no. 4. 1-22 p. 1952.

A worthwhile feature of this report is the attempt to correlate availability of a food with its use. Grouse. 89 crops (Oct.) examined. Aspen, clover, ironwood, plantain, oak, and dandelion were important foods. Ironwood apparently was sought, for it was scarce in area. Birch was little used. Present practice of planting clover and other legumes in forest trails should be helpful. Pheasant. Crops of 14 wild birds and 20 released birds examined. All birds were shot on same area during hunting season. Wild birds chiefly ate buckwheat. Released birds chiefly ate corn, and sampled far more foods than did wild birds. False climbing buckwheat was not taken, though abundant. A feeding experiment revealed that pheasants lose weight on diet of entirely ragweed or smartweed seed. Quail. 26 crops (fall) examined. Ragweed and corn important. Lambsquarters abundant but not taken. Mink. 57 stomachs examined for 2 consecutive winters, Horicon Marsh. Many muskrats were eaten first year, when population was high and many wandered. No predation on muskrats was found second year, but predation on birds and fish was much higher; winter kill made fish available.

WILDLIFE--NATURAL AREAS

Anonymous. [GILA WILDERNESS AREA.] Living Wilderness 17(43): 24-25, map. Winter 1952-53.

Present status and limits of this area as defined by Forest Service following hearings. The outcome is satisfactory to preservationists, for the 410,000-acre tract includes some virgin ponderosa pine that had been proposed for cutting.

Branch of Wildlife Refuges. NATIONAL WILDLIFE REFUGES ADMINISTERED BY THE FISH & WILDLIFE SERVICE. U. S. Fish & Wildlife Service, Wildlife Leaflet 179. 10 p. Revised July 1952.

Names, locations, dates of establishment, sizes, classes, main animals. Data are largely tabular.

Hall, William B. MICHIGAN'S NATURAL AREAS COUNCIL. Living Wilderness 17(43): 20-22, charts and maps. Winter 1952-53.

This organization has been set up for the preservation of natural areas, and already has achieved worthwhile results. The article tells how the council is organized, how it functions, and what some of its unsolved problems are. Four types of natural areas are recognized: (1) scenic sites, (2) nature study preserves, (3) natural area preserves, (4) natural area reserves. They differ in purpose, size, and degree of protection.

Wagar, J. V. K. AN ANALYSIS OF THE WILDERNESS AND NATURAL AREA CONCEPT. Journal of Forestry 51(3): 178-183. March 1953.

Discusses pros and cons of wilderness preservation, emphasizing man's need of large wild areas for recreation, for exercise of the pioneering urge, and for maximum intellectual and spiritual development of certain types. Loss of a wilderness is permanent; what we destroy, all future generations are denied.

WILDLIFE--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Breland, Osmond P. HOW LONG DO THEY LIVE? Natural History 61(3): 131-134, 141-142, illus. March 1952.

Discusses longevity records for many kinds of animals. Some invertebrates have surprisingly long lives, but certain vertebrates do not live as long as generally supposed. No bird is known to have lived longer than 68 years, no elephant longer than 69 years. Apparently man and tortoises hold all longevity records for animals. [See also Griswold, p. 52 of this issue of WR.]

WILDLIFE--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION--Continued

Griffin, Donald R. SENSORY PHYSIOLOGY AND THE ORIENTATION OF ANIMALS. American Scientist 41(2): 208-244, 281, illus. April 1953.
Dr. Griffin tells in an interesting, semitechnical way about the many methods by which birds, bats, bees and other animals are able to home, navigate, or avoid obstacles. Experiments are described and material is drawn from recent works. There is much that we still do not know, and no doubt some surprising adaptations and behavior patterns will be discovered, as von Fisch found for bees and Kramer for birds. The author expressly warns, however, that it is most unlikely that any sort of "sixth sense" is involved in orientation.

Hammond, John, Jr., C. M. Kirkpatrick, and A. C. Leopold. PERIODICITY IN ANIMALS: THE ROLE OF DARKNESS. Science 117(3041): 389-391. April 10, 1953.
Primarily a debate, with various original data given, over certain interpretations in the 1952 paper by Kirkpatrick and Leopold on role of darkness in quail reproduction.

Pearson, Oliver P. THE METABOLISM OF HUMMINGBIRDS. Scientific American 188(1): 69-72, illus. Jan. 1953.
Interesting semipopular account of correlation between metabolic rate and animal weight, with special reference to experiments with hummingbirds. All warm-blooded animals seem to fall on the same curve when weight is plotted against oxygen consumption. Metabolic rate increases rapidly among the smaller animals, with hummingbirds (the smallest endotherms) having the highest rate. Their rate is so high that it could not be maintained over night without feeding. But during the night the rate drops about 15 times; body temperature falls nearly as low as that of the air and the bird is in a state resembling hibernation. Shrews, on the other hand, feed during the night to maintain their slightly lower metabolic rate. Rough estimates suggest that hummingbirds do not carry enough fuel (fat) to fly across the Gulf of Mexico.

Thorpe, W. H. THE DEFINITION OF TERMS USED IN ANIMAL BEHAVIOR STUDIES. Bull. Anim. Behav. 9: 34-40. 1951. [From review by R.A.H., Ibis 93(4).]
A conference at Cambridge in 1949 attempted to define current usage of terms in animal behavior study. This paper sets out definitions acceptable to the majority, or gives alternative definitions. It is hoped that it will be used as a point of reference for all engaged in behavior studies.

WILDLIFE--BIOTAS, COMMUNITIES, GENERAL ECOLOGY

Barbour, Roger W. ANIMAL HABITATS ON BIG BLACK MOUNTAIN IN KENTUCKY. Transactions of the Kentucky Academy of Science 13(4): 215-220. Aug. 1952.
This mountain, the highest in Kentucky, lies chiefly in Harlan County. On the basis of 4 months of collecting mammals, reptiles, and amphibians, the author recognizes 6 major habitats (such as aquatic, brushland, and rockland) and several subdivisions (such as beech-birch-maple and oak-hickory-chestnut). Each type of area is briefly characterized and some of its vertebrates are listed. Small mammals were about 3 times as abundant in beech-birch-maple forest as in oak-hickory-chestnut forest. Reptiles were most numerous in both individuals and species in man-made habitats, as along logging roads. Habitats are being so greatly altered by lumbering and mining that the only known Kentucky habitats for some small mammals may be destroyed.

Carl, G. C., C. J. Guiguet, and G. A. Hardy. A NATURAL HISTORY SURVEY OF THE MANNING PARK AREA, BRITISH COLUMBIA. British Columbia Provincial Museum (Victoria), Occasional Papers no. 9. 1-130 p., illus. July 1952. [From Journal of Mammalogy 34(2).]

WILDLIFE--BIOTAS, COMMUNITIES, GENERAL ECOLOGY--Continued

Dice, Lee R. NATURAL COMMUNITIES. University of Michigan Press. x + 547 p., illus. 1952. $5.50.
Although an introduction to or textbook of animal ecology, this book treats plant ecology as fully as is desirable for background. It is a discussion of the principles and methods of bioecology with much illustrative material selected from the world's literature. It is not a description of communities, and to a large extent it is free of ecological jargon and classification, although the concepts and systems of ecological classification are discussed. Emphasis is placed on factors affecting the ecology of animals. Statistical methods of study are demonstrated with concrete examples. The book is simply written and well organized. It is more readable than most books of its type. Unfortunately, the manuscript was completed in 1949. Following the chapter "Estimation of populations," for example, no reference published since 1944 is cited, and the 48-page bibliography lists very few papers printed after 1948. This difficulty, however, hardly affects the book's value as an introduction to its broad field.

Ekman, Sven. ZOOGEOGRAPHY OF THE SEA. Macmillan Co., 60 5th Avenue, N. Y. 11, N. Y. 417 p. 1953. $6.50. [From review in A.I.B.S. Bulletin 3(2).]
"A large part of the book is occupied with the animal life of the continental shelves...The life of the seas at various depths occupies a considerable part of the text and a comprehensive description of the plankton community is included." English translation of a Swedish work.

Ricketts, Edward F., and Jack Calvin; Joel W. Hedgpeth, reviser. BETWEEN PACIFIC TIDES. Stanford University Press, Stanford, Calif. xiii + 502 p., illus. 1952. $6.00. [From review by J. E. Fitch, California Fish and Game 39(1).]
"Ever since...first published in 1939, it has been almost a necessity for those...wishing to know the shallow-water and shore fauna of the Pacific Coast (Baja California to Alaska). A revised edition in 1948 and this, a third edition just four years later, attest its continued popularity...in its present form [it] is one of the best and most up to date of the available, popular accounts of Pacific Coast 'tide pool' life." The revised edition embodies a new chapter on intertidal zonation, some other new material, and corrections. Many new plates have been added, making a total of 47 plates and 134 figures.

WILDLIFE--NUMBERS AND NUMBER FLUCTUATIONS

Clemens, W. A. ON THE CYCLIC ABUNDANCE OF ANIMAL POPULATIONS. Canadian Field-Naturalist 66(5): 121-123, graph. Sept.-Oct. 1952.
Points out briefly that variations in abundance of year-classes of Pacific salmon are fundamentally different from cyclic population changes of some other animals (such as hare and grouse) in that salmon year-class groups are of uniform rather than mixed ages.

WILDLIFE--PARASITES AND DISEASES

Hightower, B. G., V. W. Lehman, and R. B. Eads. ECTOPARASITES FROM MAMMALS AND BIRDS ON A QUAIL PRESERVE. Journal of Mammalogy 34(2): 268-271. May 1953.
"A severe infestation of bobwhite quail in a south Texas game preserve by larval and nymphal rabbit ticks, Haemaphysalis leporis-palustris, is reported. An ectoparasite survey of the game preserve fauna was made to determine the extent to which other animals were being parasitized." Results of the survey are detailed.

WILDLIFE--MORTALITY FROM INSECTICIDES, WEATHER, CARS, ETC.

Bundren, John, D. E. Howell, and V. G. Heller. ABSORPTION AND TOXICITY OF DIELDRIN. Proceedings of the Society for Experimental Biology & Medicine 79(2): 236-238. Feb. 1952.
Report of experiments with laboratory rats, rabbits, and cows.

WILDLIFE--MORTALITY FROM INSECTICIDES, WEATHER, CARS, ETC.--Continued

Cottam, Clarence. WILDLIFE AND CHEMICALS. Virginia Wildlife 14(5): 10-12, illus. May 1953.
Reviews effects of insecticides and herbicides on wildlife and its habitats. Today 500,000 tons of these and other chemical control agents are produced annually. Chlorinated hydrocarbon insecticides accumulate in soil and where heavily applied may injure crops in 5 years. Some insects have become resistant to insecticides and more toxic compounds are used. Ditching is again being employed to control mosquitoes, thus reducing wildlife habitat. Herbicides may destroy wildlife food and cover plants, but can be used to improve many areas for game. We need: 1. Specialized control methods (chemical or cultural) that will not injure beneficial animals. 2. More study of effects of numerous chemicals. 3. Education for proper use of chemicals.--Paul F. Springer.

Gale, Larry R. 1951 HIGHWAY MORTALITY. Kentucky Happy Hunting Ground 7(6): 8, 32, illus. Nov. 1951.
Recorded highway kill of different classes of game in Kentucky is tabulated by districts. Data were gathered by conservation officers.

Gale, Larry R. GAME KILL ON STATE HIGHWAYS IS GREAT. Kentucky Happy Hunting Ground 9(1): 8, illus. Jan. 1953.
Includes tabulation showing numbers of various types of wildlife found dead on roads by 110 Kentucky conservation officers, Sept. 1951-Aug. 1952. Rabbits and opossums were outstanding victims.

Glazener, W. C. WILDLIFE UPROOTED. Texas Game and Fish 11(3): 16-19, illus. Feb. 1953.
In September 1952, 17 to 20 inches of rain fell within a few hours on the watershed of the Pedernales River, Gillespie Co., Texas. This short article and its 7 good photos show how the valley was scoured and gullied and trees were uprooted. Much of the little wildlife habitat in the region was completely ruined.

Linduska, J. P. WILDLIFE IN A CHEMICAL WORLD. PART 2. Audubon Magazine 54(4): 248-252, illus. July-Aug. 1952.
Concluding part of article begun in preceding issue. Reviews wildlife effects of DDT and other insecticides as shown by various studies. Certain of the newer compounds are 100 times as toxic as DDT. Their margin of safety is slim, and their effect on animal life requires careful appraisal.

Livingston, M. L. PARATHION POISONING IN GEESE. Journal of the American Veterinary Medical Association 120(898): 27. Jan. 1952.
Symptoms and treatment of domestic geese affected by parathion and DDT spray that drifted into their pasture from treated orchard.

Mitchell, R. T., H. P. Blagbrough, and R. C. Van Etten. THE EFFECTS OF DDT UPON THE SURVIVAL AND GROWTH OF NESTLING SONGBIRDS. Journal of Wildlife Management 17(1): 45-54, illus. Jan. 1953.
In 1949 and 1950, DDT at 3 lbs. per acre was applied by air to ½ of a 40-acre tract of abandoned fields containing 293 bird boxes. 303 house wren nestlings were involved in the study. Fledging success of first brood wrens in 1949 was 28% in treated area compared to 86% in unsprayed area. In 1950, when area was sprayed earlier, before peak of hatch, fledging success in sprayed area was 70% compared to 73% in check area. Average weights of 1st brood wren nestlings in sprayed area in both 1949 and 1950 were significantly lower than in check area. Weights of 2nd brood in 1949 were lower but not significantly so. In 1950, weights of 2nd brood wrens in sprayed area closely approximated those of check area. Very young birds are particularly susceptible. Damage to bird life can be minimized by making DDT applications a week or so before appreciable numbers of eggs hatch or by delaying it until most nestlings have fledged.--R. T. Mitchell.

WILDLIFE--MORTALITY FROM INSECTICIDES, WEATHER, CARS, ETC.--Continued

West, T. F., J. E. Hardy, and J. H. Ford. CHEMICAL CONTROL OF INSECTS. John Wiley and Sons, N. Y. xi + 211 p., illus. Jan. 1953. $3.25. [From review in Annals of the Entomological Society of America 46(1).]

"The authors of this book have endeavored to survey the development of modern insecticides. In this endeavor they have crammed much more into the 211 pages. Well over half of the text has been devoted to a discussion of the 'older' insecticides, an outline of pest control, repellents and attractants, and very brief treatment (5 pages) of weed control." Apparently was a few years out of date when published. Contains few references since 1946, and "Many of the insecticides now accepted as an integral part of present crop protection are referred to as 'preliminary.'"

WILDLIFE--MANAGEMENT--GENERAL

Arizona. ARIZONA GAME SURVEYS: PROJECT JOB COMPLETION REPORTS, 1952. Arizona Game and Fish Commission. About 320 p., illus. [1953.]

Job completion reports ordinarily are not, and are not considered to be publications, but this thick, processed, paper-bound volume "contains job completion reports of the surveys and investigations program which are considered to be of special interest." It also contains detailed maps, photographs, and much statistical information. The 21 articles included are by 9 staff members and are separately paged. In format they are detailed administrative reports accompanied by much numerical data and without bibliographies. Each has a summary. Reports discuss: (1) hunts for antelope, elk, white-tailed and mule deer, javelina, turkey, squirrel, buffalo, and quail; (2) game trend and distribution surveys of antelope, elk, white-tailed and mule deer, quail, and waterfowl concentration areas; (3) investigations of range utilization, Kaibab North, effect of predator control on game populations, and evaluation of wildlife use of quail rainwater catchments, with suggestions for improvement of these catchments.

Barker, Elliott S. HOW INSUFFICIENT FUNDS DEFEAT SUCCESSFUL WILDLIFE MANAGEMENT. 41st Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 10-11, 1951, Rochester, N. Y. 68-76 p. 1951.

Examples from many states. A few game departments consider themselves well off, while others are so pinched by their legislatures that they cannot use funds that are legally theirs, or are forced to lose PR monies for lack of matching funds. Important projects often have to be passed up or delayed until they are far more costly.

Biggs, J. A. A COMPARISON OF WILDLIFE MANAGEMENT BETWEEN WASHINGTON AND BRITISH COLUMBIA. Report of Proceedings, 6th Annual Game Convention, Vernon, B. C., May 7-10, 1952. British Columbia Game Department, Victoria, B. C. 142-147 p. 1952.

Cottam, Clarence. REPORT OF COMMITTEE ON WILDLIFE CONSERVATION PLANNING. 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952, Dallas, Texas. 96-103 p. 1952.

Cowan, I. McT. RUTS AND RIDGES: SOME MAJOR ISSUES IN WILDLIFE CONSERVATION. Report of Proceedings, 6th Annual Game Convention, Vernon, B. C., May 7-10, 1952. British Columbia Game Department, Victoria, B. C. 63-70 p. 1952.

Cypert, Eugene, Jr. A LOOK AT KENTUCKY WOODLANDS. Transactions of the Kentucky Academy of Science 13(4): 270-274. Aug. 1952.

History, characteristics, and game of this 65,000-acre federal refuge. A fine native strain of wild turkey is present, but numbers have slumped for unknown reasons. Deer have thrived except for an epizootic in 1949. Waterfowl use of the refuge is increasing greatly and management measures have been successful. The state takes turkeys, deer, and raccoons from the refuge for restocking; squirrels and raccoons are hunted in some years; fur animals are trapped when it is deemed desirable to reduce their populations.

WILDLIFE--MANAGEMENT--GENERAL--Continued

Day, Albert M. GENERAL ROUND-UP OF WILDLIFE CONSERVATION. 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952, Dallas, Texas. 117-121 p. 1952.
Reviews accomplishments and present problems; tells how present problems are being or should be attacked.

Eckles, T. V. THE UNWISE CATERING TO PRESSURE GROUP DEMANDS. 41st Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 10-11, 1951, Rochester, N. Y. 58-61 p. 1951.

Elkins, W. A. PRESSING PROBLEMS IN ADMINISTRATION OF WILDLIFE RESOURCES IN ALASKA. Science in Alaska, Special Publ. Arctic Inst. North Amer. (Washington) no. 1. 268-281 p. June 1952. [From Journal of Mammalogy 34(2).]

Ford, Corey. IS ALASKA'S WILDLIFE DOOMED? PART I. Field and Stream 57(10): 32-33, 128-131, 141, illus. Feb. 1953.
If not doomed, at least it is in grave danger, according to the author of this forceful article. Increased human population and continued exploitation are putting a severe drain on fish and wildlife. Areas that not long ago were remote and well stocked with fish and game are now overfished or overhunted. The lichen ranges and fresh waters inherently have low productivity, and are slow to recover from abuse. Funds for enforcement, management and research are minute in comparison with the need. Various interests keep pressing for fewer restrictions and more exploitation. Part of the conflict is over salmon fishery regulations and other problems, but there are proposals to control, if not exterminate, the Kodiak bear.

Ford, Corey. IS ALASKA'S WILDLIFE DOOMED? PART II. Field and Stream 57(11): 40-42, 136-141, illus. March 1953.
There are probably not over 8,500 brown bears left, but efforts are being made to have them exterminated on Kodiak Island because they kill some salmon and a few cows--on an island that is largely a bear refuge and is unsuitable for cattle, and where guides outnumber ranchers. Figures on the situation are given. Some game (including moose) and fur animals are thriving in Alaska, partly because of transplanting and careful regulation. The muskox colony on Nunivak Island is not considered successful because it has increased only from 25 to 70 in 20 years. One Eskimo village, situated at a crucial pass, kills more caribou than the rest of Alaska together, and the villagers refuse to change their ways while the diminishing herd still exists. Their dogs alone require at least 1,400 caribou a year.

Fowle, C. David. MODERN METHODS OF GAME RESTOCKING. 41st Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 10-11, 1951, Rochester, N. Y. 144-152 p. 1951.
Reviews many recently developed methods used in stocking various types of birds and mammals. Emphasis is on gentle release and utilization of healthy, well adapted strains. Success is to be judged by survival, not numbers released. Stocking has a place in (1) replenishing the animals of good but understocked or unstocked habitat, (2) introduction of exotics, (3) stocking for immediate shooting when the great cost of this practice is understood and accepted. 36 references.

Frye, Thos. D. HOW CAN WILDLIFE MANAGEMENT KEEP PACE WITH MODERN TRENDS? 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952, Dallas, Texas. 57-64 p. 1952.

WILDLIFE--MANAGEMENT--GENERAL--Continued

Gabrielson, Ira N. CRISIS FOR ALASKAN WILDLIFE. Audubon Magazine 53(6): 348-353, 394-395, illus. Nov.-Dec. 1951.
The annual harvest of fur animals has reached its peak, if fur-bearer populations are to be maintained. Illegal hunting has nearly destroyed certain herds of Dall's sheep. One herd of caribou that numbered over 500,000 is reduced to remnants; the total caribou population of the territory is only about 160,000. Well armed natives are making destructively large game kills. The Alaskan Legislature has passed a resolution favoring removal of all protection from Kodiak bears because they kill cattle. Annual loss of cattle on Kodiak is valued at $457, and the total cattle potential of the island is only 3,800 head even with supplemental feeding. Guide fees alone on the island come to $52,000 annually. The great waterfowl breeding areas of Alaska should be withdrawn from homestead entry, and eventually some may have to be set aside as refuges. At present, the greatest need of Alaskan wildlife is more game agents. [A change in public sentiment is also much needed; it is reported that, aside from guides, public opinion in Alaska is almost solidly against bears.]

Gabrielson, I. N., W. J. Silva, I. T. Quinn, and Seth Gordon. THE IDEAL RELATIONSHIP BETWEEN COMMISSIONERS AND ADMINISTRATORS. 41st Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 10-11, 1951, Rochester, N. Y. 39-51 p. 1951.

Glading, Ben. INSECURE TENURE OF COMPETENT WILDLIFE PERSONNEL. 41st Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 10-11, 1951, Rochester, N. Y. 62-66 p. 1951.
Discusses employment policies and qualifications, especially for top administrators. In many states there is too much turnover at the top--average tenure of a director is only 4½ years. On the other hand, it should be easier than it is under some civil service systems to release incompetents of any rank. "...yardsticks of competency should be set up and adhered to; qualified personnel should be given tenure and adequate compensation, and misfits should not be tolerated."

Glassen, Harold W. DO STATES STILL OWN THEIR GAME AND FISH? 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952. Dallas, Texas. 32-38 p. 1952.

Gutermuth, C. R. HOW REGIONAL, NATIONAL, AND INTERNATIONAL ORGANIZATIONS CAN BEST SERVE THE OVERALL CONSERVATION PROGRAM. 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952, Dallas, Texas. 132-136 p. 1952.
Many of these organizations belong to the Natural Resources Council, which results in unified policies, quick dispersal of critical information, and coordinated action. The organizations retain their identities and are active in their fields of special interest. They advise and consult with government agencies, they educate the public, and exert political pressure when it is justified.

Harris, R. S. MODERN LAW ENFORCEMENT TOOLS. 41st Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 10-11, 1951, Rochester, N. Y. 135-141 p. 1951.

Kimball, Thomas L. FUTURE MATCHING AND ADMINISTRATION OF FEDERAL FUNDS. 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952, Dallas, Texas. 65-69 p. 1952.

WILDLIFE--MANAGEMENT--GENERAL—Continued

Lewis, Harrison F. THE ROLE OF CERTAIN TREATIES IN WILDLIFE MANAGEMENT. 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952, Dallas, Texas. 143-149 p. 1952.

Canadian treaties with Indians should be altered to avoid destruction of game populations. The Migratory Birds Treaty should be changed to permit: earlier harvest of waterfowl by residents of the Arctic; changing a species from protected to unprotected status; gathering and use of eggs of injurious birds (i.e., gulls now controlled otherwise); utilization of Brunnich's murre in Newfoundland; and exact specification by name of groups protected.

Martin, P. W. CURRENT CONDITIONS AND MANAGEMENT PROBLEMS WITH RESPECT TO OUR GAME IN CENTRAL BRITISH COLUMBIA. Report of Proceedings, 6th Annual Game Convention, Vernon, B. C., May 7-10, 1952. British Columbia Game Department, Victoria, B. C. 18-23 p. 1952.

Müller-Using, D. GENERAL PRINCIPLES OF MODERN GAME MANAGEMENT (Grundlagen moderner Jagdwirtschaft). Krögers Verlagsanstalt, Hamburg, Blankenese. 152 p. 1949. DM 5.60. [From long review by Kaj Westerskov, Journal of Wildlife Management 17(1).]

The first part of the book is a survey of the history and development of the European hunting system, and of the practical importance of the sport. "The second part of this work is of most interest to the biologist; it is on game statistics as the basis for management practices. The major German species are discussed in fair detail, and whereas the official...game statistics for...1935-39 is the nucleus of this treatment, older statistics from provinces, state forests and private estates are also incorporated." The volume summarizes a vast collection of detailed game statistics, and in Germany such statistics are available for hundreds of years. Some of the author's figures and findings are given in Westerskov's review.

Nelson, Bernard A. WILDLIFE RESTORATION. South Dakota Conservation Digest 20(3): 2-9, illus. March 1953.

A long article describing the status and problems of each type of game in South Dakota and telling what management measures are being employed. In general, more intensive land use is continuing to reduce wildlife habitat.

Popov, Boris H., and Jessop B. Low. GAME, FUR ANIMAL AND FISH INTRODUCTIONS INTO UTAH. Utah State Department of Fish and Game, Miscellaneous Publication no. 4. iii + 85 p., maps. No date. [1953.]

Takes up all introduced or transplanted species, listing all known releases and their fates, and discussing in brief the present status of the species in Utah. Maps show known release points and ranges of species in Utah as of 1950. Most successful birds and mammals have been pheasant, California quail, Hungarian partridge, elk, and antelope. Bobwhite and turkey have not done well. Chukars now appear to be taking hold. Dark muskrats are still occasionally found. Nutria have established a small range. Bison seem to be established in one open area but are not allowed to increase markedly because of conflicts with livestock and grazing.

Quinn, I. T. POLICIES AND OBJECTIVES OF THE INTERNATIONAL ASSOCIATION OF GAME, FISH AND CONSERVATION COMMISSIONERS. 41st Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 10-11, 1951, Rochester, N. Y. 27-29 p. 1951.

Riley, Charles Victor. AN EVALUATION OF RECLAIMED COAL STRIP MINED LANDS AS WILDLIFE HABITAT. PhD thesis, Ohio State University. 256 p. 1952.

Ruhl, Harry D. REPORT OF FEDERAL AID COMMITTEE. 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952, Dallas Texas. 22-26 p. 1952.

WILDLIFE--MANAGEMENT--GENERAL--Continued

Schneider, P. W. APPLICATION OF RESEARCH IN MODERN GAME AND FISH ADMINISTRATION. 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952, Dallas, Texas. 112-116 p. 1952.

Schwartz, Leonard. REPORT OF THE COMMITTEE ON OPERATING AGREEMENTS WITH FEDERAL AGENCIES. 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952, Dallas, Texas. 94-95 p. 1952.

Shoemaker, Carl D. STATUS OF NEW AND PENDING LEGISLATION. 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952, Dallas, Texas. 123-131 p. 1952.
Discusses Tackett Bill, Key Deer Refuge Bill, and others, but the bulk of the paper is devoted to a strong statement on the appallingly rapid loss of waterfowl habitat, and an urgent plea for more waterfowl refuges financed from PR reserve funds.

Staff, Missouri River Basin Studies. WILDLIFE RESOURCES OF IRRIGATED AND NONIRRIGATED LANDS, YELLOWSTONE WILDLIFE STUDY UNIT, MONTANA. U. S. Fish and Wildlife Service, Missouri River Basin Studies, Billings, Montana. ii + 83 + 3 p. appendix, illus. Dec. 1952.
A large irrigated area of mixed farming and a large area of dry farming, both in south-central Montana, were compared (1948-49) as to wildlife resources and sportsmen's expenditures. The study areas are thought to be fairly representative of similar areas in the short-grass region of the Upper Missouri country. Data were treated statistically and results are given in detail. The 2 areas were, in large part, preferred by different types of game. The irrigated area produced far more upland game, fur, and waterfowl. It was used 12 times as much by sportsmen and led to 17 times as much expenditure by them.

Steen, M. O. REPORT OF THE COMMITTEE ON THE INTRODUCTION OF EXOTIC ANIMALS. 41st Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 10-11, 1951, Rochester, N. Y. 24-26 p. 1951.
Recommends: expansion and acceleration of the work of introducing desirable new game animals; study of all kinds of birds, mammals, and fish (game or non-game) before their introduction is permitted; tighter legal controls against introduction of species known or thought to be undesirable. The report was adopted by the Association.

Steen, M. O. REPORT OF THE COMMITTEE ON THE INTRODUCTION OF EXOTIC ANIMALS. 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952, Dallas, Texas. 89-91 p. 1952.
Discusses and recommends further testing and introduction of exotic game birds.

Swift, Ernest. POLICY REGARDING RELATIONSHIPS BETWEEN RESEARCH AND ADMINISTRATION. 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952, Dallas, Texas. 70-75 p. 1952.

Swift, Ernest F. THE ROAD TO WILDLIFE ABUNDANCE IN WISCONSIN. Wisconsin Conservation Bulletin 18(3): 14-28, illus. March 1953.
Describes, for each region and for each management area, what the state is doing in habitat management. More than 50 areas are discussed briefly.

Thompson, Seton H. MANAGEMENT OF THE MARINE RESOURCES OF ALASKA. Science in Alaska, Special Publ. Arctic Inst. North Amer. (Washington) no. 1. 282-291 p. June 1952. [From Journal of Mammalogy 34(2).]

WILDLIFE--MANAGEMENT--GENERAL--Continued

Titus, Harold. EFFECTS OF POLITICAL INTERFERENCE ON WILDLIFE ADMINISTRATION. 41st Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 10-11, 1951, Rochester, N. Y. 78-82 p. 1951.
Interesting examples reveal how stupid and selfish political meddling can be, and how opposition to it can wreck a game department. The best defense is a well informed public with confidence in the department, and strong backing from conservation organizations.

Wente, Carl F. OUR WESTERN WATER PROBLEMS IN RELATION TO FISH AND GAME MANAGEMENT. 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952, Dallas, Texas. 76-80 p. 1952.

WILDLIFE--MANAGEMENT--HARVESTS AND HUNTING

Anonymous. FIGURES RELEASED ON 1952 SMALL GAME HARVEST. Pennsylvania Game News 24(3): 46. March 1953.
Estimated total kills, Pennsylvania. Substantially increased kills were made of snowshoe hare, squirrel, ruffed grouse, and dove. No great decrease was noted for any form of small game.

Anonymous. PENNSYLVANIA GAME COMMISSION, OFFICIAL 1952 GAME KILL. Pennsylvania Game News 24(5): 44. May 1953.
Estimated total kills for state, 1951 and 1952. Tabulation is by species or group.

Fosburgh, P. W. PROBLEMS IN FREE PUBLIC HUNTING. New York State Conservationist 7(4): 2-4. Feb.-Mar. 1953.
Outlines possible solutions that the N. Y. Bureau of Game is considering for problems of: 1. deer management, 2. protection of landowners' interests, 3. improvement of sportsmen's conduct, 4. hunting safety. Most of the proposals are along the lines of more regulation and heavier penalties.

Gale, Larry R., and Robert H. Myers. CONSIDERABLE CHANGE IN KENTUCKY SMALL GAME POPULATIONS. Kentucky Happy Hunting Ground 8(3): 6-7. May 1952.
Discusses results of 1951-52 hunting season and presents tables showing hunting pressure and hunter success for various forms of game, with indication of trends. "The 1951-52 season was less successful than the previous year for squirrels and quail, slightly more successful for rabbits. Furbearers and waterfowl seem to be increasing or holding their own. Doves declined sharply in 1951, and ruffed grouse apparently are nearly level in the better grouse counties, although the occupied range is being extended."

Mosby, Henry S. A BRIEF REPORT ON THE 1952 BIG LEVELS REFUGE HUNT. Virginia Wildlife 14(3): 18-19, map. March 1952.
Report on game seen and killed during supervised hunt on part of George Washington National Forest, Va. Suggestions are given for speeding work at checking stations. Comparative weights are given for deer of different sex and age groups killed in 1951 and 1952. Deer became warier during the hunt; it is believed that kill would have been considerably higher if the hunter-choice day had been on the first rather than the last day of the period.

Phelps, Chester F. A REPORT: THE 1952-53 DEER, BEAR AND TURKEY KILL. Virginia Wildlife 14(4): 22,26. April 1953.
Discussion, and tabulation by counties, 1950-53. The 1952 Virginia deer kill of nearly 11,000 represented a good increase. The state is alert to possible overpopulation and permitted doe shooting on last day of season in 6 counties. The bear kill of 327 probably was dangerously high in relation to population. Turkey kill dropped from 2,148 to 1,608 in 1 year; special studies are being launched in hope of checking this alarming trend. Land use trends probably are part of the trouble.

WILDLIFE--MANAGEMENT--HARVESTS AND HUNTING--Continued

Stiles, Bruce F. KEEPING LAND OPEN TO PUBLIC HUNTING. 41st Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 10-11, 1951, Rochester, N. Y. 122-125 p. 1951.

Why so much land is open to hunting in Iowa. Most people in the state have enough farm background to be reasonably well behaved when hunting. Individual hunters should establish friendly relations with farmers before hunting season.

Wolf, Bill. THE AGE OF MIRACLES RETURNS. Pennsylvania Game News 24(5): 4-11, illus. May 1953. [Also in Sports Afield, Jan. 1953.]

Enthusiastic report on success of the Pennsylvania Cooperative Farm-Game Program. The State Game Commission has persuaded farmers to open approximately 1,000,000 acres, in blocks of at least 1,000 acres. Protection from hunter damage, habitat improvement, and other benefits are afforded landowners. Cost to the state is about 25¢ per acre per annum.

WILDLIFE--MANAGEMENT--FARM

Anonymous. [VALUE OF FIELD BORDERS TO ECONOMICAL FARMING.] Virginia Commission of Game and Inland Fisheries, Educational Bulletin no. 91. 2-3 p. May 15, 1953.

"When a field border of perennials has been established...it is no longer necessary to cultivate a strip of land which is unproductive. These borders provide valuable turnrows for machinery and teams as well as driveways in harvesting crops...Particular attention has been paid to the development of plants which will not spread, and these plants will leaf out year after year from the stalks even after they have received the roughest kind of treatment." They help hold back encroachment of woods. "There are many cases in which bicolor lespedeza has been used on badly eroded ground which, apparently, would not support any sort of vegetation. These plants have incredible horizontal root growth. When once established, they hold the ground in place and new soil very quickly begins to form. There are many cases in which badly eroded hillsides are now producing rank vegetation where pine trees formerly would not grow."

Baskett, Thomas S. PRUNING AS A MEANS OF THICKENING MULTIFLORA ROSE HEDGES. Journal of Wildlife Management 17(1): 87-88. Jan. 1953.

Greatest density of young vigorous hedges was obtained by mowing at height of 10-14 inches. Height growth and fruit production were retarded for only a year.

Boldt, Wilbur. SHELTERBELTS, WILDLIFE PLANTINGS AND PHEASANTS. North Dakota Outdoors 15(9): 4-5, illus. March 1953.

Shelterbelts are not intended as winter cover for game. Often they fill with snow and prove death traps for pheasants. The author tells in detail how plantings should be made to provide winter game cover in North Dakota. Many rows of plants covering a large area are necessary and their selection and arrangement must be well planned.

Durell, James S. FARM GAME HABITAT RESTORATION IN KENTUCKY. Presented at 6th Annual Conference, Southeastern Association of Game and Fish Commissioners, Oct. 19-22, 1952, Savannah, Ga. 1-13 p., graph. [Available from J. H. Jenkins, U. of Ga., Athens.]

Similar to earlier paper (see WR 69:11). Describes planting project, emphasis of which is on L. bicolor, evaluates plantings in respect to adequacy of establishment, and discusses difficulties involved. Many of the plants distributed were never planted. A 325% increase in plants distributed brought only an increase of 56% in plots established. Economic wisdom of the bicolor project in Kentucky is somewhat questioned. "In some areas, it is more remunerative to provide more cover rather than more food."

WILDLIFE--MANAGEMENT--FARM--Continued

Hundley, Louis Reams. THE ESTIMATION OF POPULATIONS OF SOME FARM GAME SPECIES. M. S. thesis, Virginia Polytechnic Institute. 47 p. 1953.

MacNamara, Lester G. SHRUB AND TREE PLANTINGS FOR IMPROVING WILDLIFE HABITAT. New Jersey Outdoors 3(9): 15-17. March 1953.
Rosa multiflora and L. bicolor may yet prove their value in New Jersey, especially for field borders. For other types of plantings, native plants are recommended, especially apple, black locust, hawthorns, dogwood, and conifers. A table lists 68 woody plants, mostly native, showing their site preferences and methods by which they may be propagated, as by root cuttings, budding, etc.

Schreiner, Keith M. SURVIVAL IN WILDLIFE PLANTINGS. North Dakota Outdoors 15(11): 26. May 1953.
Survival of trees and shrubs in North Dakota wildlife plantings made in 1951 and 1952 was surveyed in August 1952. Figures are given for 23 species. Primary reasons for failures were lack of precipitation and lack of proper cultivation. Livestock caused much damage when allowed in plantings. Jackrabbits did a great deal of tip pruning, and in some areas completely consumed the fruiting species and elms.

Sedam, John B. FOOD AND COVER FOR FARM WILDLIFE. Pennsylvania Game News, Special Issue no. 6. 1-80 p., illus. March 1953.
A picture story presenting many practical methods of improving farms for wildlife. One section discusses measures that can be used on good farms where wildlife is incidental. Another section discusses the planning and management of marginal farms primarily for wildlife. A final section gives instructions for various types of planting. The booklet should be of considerable value in extension work.

WILDLIFE--MANAGEMENT--FOREST AND RANGE

Biswell, H. H., R. D. Taber, and A. M. Schultz. MANAGING BRUSHLAND FOR GAME. California Agriculture 7(2): 5, illus. Feb. 1953.
Management of chamise brushlands of northwestern California. Material summarized from California Fish and Game 38(4): 453-484. [Discussed in WR 70:12.]

Biswell, H. H., A. M. Schultz, and D. W. Hedrick. A POSSIBLE METHOD OF INCREASING WESTERN MOUNTAIN MAHOGANY ON GAME RANGES. California Fish and Game 39(2): 187-189, illus. April 1953.
This browse species (Cercocarpus betuloides) is important to deer and livestock "Based on the above observations, it would appear that controlled fires might be used in some instances to increase the abundance of western mountain mahogany. If this is attempted the firing should be restricted to years of heavy seed crop, when the seeds are nearly ripe and before they fall. The ideal fire seems to be one intense enough to kill the mountain mahogany trees and other shrubs but not so severe as to injure the seeds on the trees."

Edwards, Malcolm G. FOREST WILDLIFE MANAGEMENT ON COOPERATIVE AREAS. Presented at 6th Annual Conference, Southeastern Association of Game and Fish Commissioners, Oct. 19-22, 1952, Savannah, Ga. 1-13 p. [Available from J. H. Jenkins, U. of Ga., Athens.]
Describes in detail the management measures used on 11 wildlife areas on Pisgah and Nantahala National Forests in mountains of North Carolina. First taken up are hunting regulation systems, boundary marking, predator control, and salt distribution. Then follows much discussion of techniques, values, and costs of: rhododendron slashing (for deer browse), creation of small openings, honeysuckle planting (important for deer browse and bank stabilization), pruning and releasing apple trees (for deer, bear, and boar), browse production by special timber cutting systems, and permanent pasture planting. [Increase of grouse and rabbit is attributed solely to predator control despite the facts that (1) much habitat improvement was underway at the same time, and (2) predator catch was small for the periods and acreages involved.]

WILDLIFE--MANAGEMENT--FOREST AND RANGE--Continued

Fichter, Edson. CONTROL OF JACK RABBITS AND PRAIRIE DOGS ON RANGE LANDS. Journal of Range Management 6(1): 16-24. Jan. 1953.
Essay on ecological fallacies of the "poison and more poison" approach. Based on survey of expert opinion and literature. Jack rabbits and prairie dogs tend to increase in response to overgrazing and to decrease as proper range vegetation is restored. They may be symptoms rather than causes of poor range conditions. "...it is time to find out the total effects of artificial control measures--to study very carefully the intimate relation between land use and populations of rodents and rabbits before we spend millions more on poison campaigns."

Holl, Donald G. MANAGEMENT OF THE CENTRAL WISCONSIN CONSERVATION AREA. Wisconsin Conservation Bulletin 18(2): 19-22, illus. Feb. 1953.
This submarginal tract of over 100,000 acres was taken over by the Resettlement Administration about 20 years ago. The CCC reforested some parts and restored marshlands in other parts. Later the area was ceded to the state. It is now a good game and timber producer, with timber already paying ¼ of management costs. Each part is classified for forestry, wildlife, or multiple management. Appropriate treatments such as flooding, burning, cutting, planting, or creation of openings are planned to suit the site and to maintain desired conditions for trees, game, or both.

Moynahan, James O. STATE-WIDE DEVELOPMENT OF BIG GAME REFUGES. Kentucky Division of Game and Fish. 1-30 p., illus. July 1951.
A detailed administrative report telling just what was done on 7 management areas in the period Feb. 1948-Jan. 1951. Animals to be aided were chiefly deer and turkey, but beaver and nutria were also involved.

Scott, D. R. M., and C. David Fowle. THE CORRELATION OF SILVICULTURAL SYSTEMS AND WILDLIFE MANAGEMENT. Forestry Chronicle 28(4): 79-84. Dec. 1952.
Demands for wood and wildlife are growing. Foresters and wildlife biologists must work together to provide the optimal yield of both resources, but each group will have to make some sacrifices. Some forest-wildlife programs of the U. S. Forest Service are described by regions.

Sharp, Ward M., and P. F. English. CLEAR CUTTINGS ATTRACT GAME. Science for the Farmer, Supplement 3 to Bulletin 540, Agricultural Experiment Station, State College, Pa. p. 11, illus. June 1952.
Ruffed grouse management in oak barrens of Centre County, Pa. "...a series of cuttings are being made on a management area of 735 acres. About 16 clear cuttings ranging from 1/8 to 1/2 acre in size are being made in pole stage timber each year for a 10-year period." About 20% of the openings are fenced against deer. "Last summer's survey showed definite results from the cuttings. Out of 15 ruffed grouse broods found on the whole area surveyed, 12 of them were on the managed area." Turkeys, rabbits, and woodchucks are also benefited.

Schultz, A. M. and H. H. Biswell. RESEEDING BURNED RANGELAND. California Agriculture 7(3): 3-4, illus. March 1953.
Early report of study of game range improvement undertaken with PR funds. Heavily burned chapparal in Madera Co., California, was seeded in the fall with annual and perennial grasses at various rates. The annual was domestic ryegrass; perennials were hardinggrass, tall fescue, and smilo. Statistical studies made the following spring gave information on values of various rates of seeding and on apparent competition. Germination and growth of annual ryegrass was early and vigorous, so much so that establishment of perennials was retarded, especially where ryegrass was planted thickly. Results may differ after first year.

WILDLIFE--MANAGEMENT--FOREST AND RANGE--Continued

Walker, Eugene A. DEER AND TURKEY REPORT FOR 1952. Texas Game and Fish 11(3): 4-7, illus. Feb. 1953.
Results of questionnaire in which 60 Texas wardens were asked to report on increase or decrease of deer and turkey, condition of these animals, numbers in storage plants as compared to 1951, changes in numbers of landowners leasing hunting rights, and changes in hunting pressure and law violations. Despite severe drought over most of the state, deer and turkey were generally in good condition. They increased in more areas than they decreased.

WILDLIFE--MANAGEMENT--WET-LAND

Ball, Robert C., and John R. Ford. PRODUCTION OF FOOD-FISH AND MINNOWS IN MICHIGAN PONDS. Michigan State College, Agricultural Experiment Station, Quarterly Bulletin 35(3): 384-391, illus. Feb. 1953.
Report of experiments in producing golden shiners and fathead minnows in farm-type ponds also stocked with black bullheads or largemouth bass.

Brown, C. J. D., and N. A. Thoreson. RANCH FISH PONDS IN MONTANA, THEIR CONSTRUCTION AND MANAGEMENT. Montana State College, Agricultural Experiment Station, Bulletin 480. Dec. 1951. [From Journal of Range Management 5(5).]

Cottam, Clarence. JAMAICA BAY SANCTUARY. University of the State of New York, Bulletin to the Schools 39(7): 213-217, illus. March 1953.
Describes (with map) this 12,000-acre marsh within the boundaries of New York City and makes a number of proposals for its development and management as a wildlife area.

Dresser, Cleveland van. DON'T DRAIN THAT MARSH! Sports Afield 129(5): 29-33, illus. May 1953.
Hope for our coastal marshes is afforded by work on the Tuckahoe Marshes of N. J. The key to controlling mosquitoes while gaining good waterfowl habitat is impoundments rather than drainage--controlled water levels rather than natural fluctuations. The chief problem mosquito lays eggs only on exposed mud flats that become stagnant pools after being flooded by very high tides. With dikes and tide gates, impoundments can be kept flooded or drained during the main mosquito (and tourist) season. Drained impoundments grow waterfowl food plants and are kept flooded from fall to spring. Excellent results have been obtained with waterfowl, and profitable crops of muskrats have been harvested. It is hoped that the method can be perfected and adapted to marsh areas all along our coasts. [Technical information on this subject can be obtained from N. J. Division of Fish and Game. See also WR 70:13 and WR 72:19.]

Jencks, Hugh. THE CHEYENNE BOTTOMS. Kansas Fish and Game 10(4): 6-9, illus. April 1953.
Describes the history of the basin and the work that is being done to convert it into a 12,000-acre waterfowl area. Many miles of dikes and canals will result in five lakes in which water level can be controlled. Cost to date has been about $2 million, mostly from PR funds. The completed project is expected to have values for fishing, boating, and hunting as well as for the waterfowl themselves.

Palmatier, E. A., and R. D. Wood. REPORT ON THE SURVEY OF RHODE ISLAND'S SALT AND BRACKISH WATER PONDS, WITH SPECIAL REFERENCE TO DUCKFOOD PLANTS, AUGUST, 1952. Rhode Island Division of Fish and Game, Information Bulletin no. 3. 1-7 p., mimeo. 1953.
Brief reports of conditions of 25 ponds in 1948, 1949 and 1952. Between 1948 and 1952, two ponds improved markedly, three deteriorated, and the rest showed little change.

WILDLIFE--MANAGEMENT--WET-LAND--Continued

Rose, E. T. THE BLUE-GREEN ALGAE PROBLEM IN IOWA LAKES. Presented at 14th Midwest Wildlife Conference, Des Moines, Iowa, Dec. 17-19, 1952. 1-12 p. 1952.
Thousands of water birds and many other kinds of birds and mammals, including domestic ones, may be killed by drinking from a single lake infested with certain blue-green algae. The problem is best known in the prairie states and provinces. Various algae may be responsible, but the one incriminated in the present study was Anabaena flos-aqua. It creates an intolerable stench when decaying, but apparently is most toxic when healthy and sporulating, particularly in the fall. City water supplies maybe endangered, and fish may be killed at night owing to lack of dissolved oxygen. Known losses at Storm Lake, Iowa, in fall of 1952 were: "Franklin's Gulls, 5,000 to 7,000; ducks 560; coots 400; pheasants 200; fox squirrels 50; muskrats 18; dogs 15, cats 4; hogs 2; hawks 2; skunk 1 and mink 1. Also there were numerous song birds observed dead on the beaches." Laboratory tests and control experiments are reported. Copper sulfate is effective but cost of treating whole lakes is prohibitive. Best measure is to treat algal concentrations formed by wind, as around margins. The chemical may be sprayed, or bags of it may be dragged through water. A concentration of 1 ppm. is desirable. Two or 3 treatments a year are usually required.

WILDLIFE--MANAGEMENT--PREDATION, CROP DAMAGE, AND CONTROL

Anonymous. BOUNTIES?--BALONEY! North Dakota Outdoors 15(9): 10. March 1953.
Gives a number of good examples of the futility and cost of bounties on predators and urges North Dakota to save the $50,000 a year wasted on bounties. Bounties rarely reduce predator populations, most bountied animals would be killed anyway, and bounties encourage all sorts of fraud.

Arnold, David A. RECENT EXPERIENCE WITH THE BOUNTY SYSTEM IN MICHIGAN. Presented at 14th Midwest Wildlife Conference, Des Moines, Iowa, Dec. 17-19, 1952. 1-5 p. 1952.
Presents evidence that predators (specifically foxes in Michigan) have not controlled trends in game species, that bounties have not controlled predators, and that much fraud was involved in the Michigan fox bounty. Much of the material may be found in other papers of the author (see WR 70:25 and 71:24). A statement worthy of emphasis because of widespread misapprehension is that fox [and certain other predator] populations did not increase during the last war because of decreased hunting and trapping effort. The fact is that fox kills were at a peak during the war despite low hunting pressure.

Green, Dorr D. MODERN METHODS OF PREDATOR CONTROL. 41st Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 10-11, 1951, Rochester, N. Y. 114-117 p. 1951.
1080 stations are an effective and selective method of coyote control when properly used in sparsely settled country. Few valuable fur-bearers include a station in their ranges, and most kinds are far more resistant to 1080 than are canids. Stations are placed to avoid woods and streams where the better fur animals live. Instances are given of game and fur animal populations increasing notably after control of large predators with 1080. Control of rabies in foxes is best treated by quick and intensive use of various standard control methods. Rabies can be stopped while leaving a reasonable number of foxes for hunting--more, in fact, than would be left by an unchecked rabies epizootic.

"J. F." PROBLEM PREDATORS, PART I. New Jersey Outdoors 3(8): 4-7, 23, illus. Feb. 1953.
Written to show the desirability of "vermin control." Local variation in predation is granted, and some predators are admitted to be more beneficial than injurious, but the general effect is to damn all flesh-eaters and to encourage extensive control work. The basic thought is that the more predators we kill the more game we have to hunt. "There are two main classes of predators, those which fly and those which live entirely on the ground or in water. They are often referred to as 'winged vermin' and 'ground vermin.' With regard to

WILDLIFE--MANAGEMENT--PREDATION, CROP DAMAGE, AND CONTROL--Continued

'winged vermin', hawks, owls and crows are the most numerous winged enemies with which we have to contend. As regards 'ground vermin', the list is a long one, including as it does foxes, skunks, weasels, mink, opossums, raccoons, coyotes, snakes, rats, cats, dogs, snapping turtles and others."

"J. F." PROBLEM PREDATORS. PART II. New Jersey Outdoors 3(9): 4-7, 26-27, illus. March 1953.
Tells how New Jersey's predator control organization operates, and lists the state's 10 main predators in order of destructiveness: 1. Great horned owl. 2. Raccoons. 3. Fox (red and gray). 4. Weasels. 5. Cats (hunting). 6. Rats (Norway). 7. Hawks (sharpshinned, goshawk, Cooper's). 8. Skunks. 9. Opossums. 10. Dogs. To each of these is devoted a section describing some of its depredations and telling (for most forms) of certain ways in which the animal is caught.

Legislative Research Committee. THE CONTROL OF PREDATORY ANIMALS. Minnesota Legislative Research Committee (State Capitol, St. Paul), Publication no. 55. ii + 40 + 18 p. appendix. Maps. Dec. 1952.
An excellent source of detailed information on control methods used in each state, species attacked, and costs involved. Data for Minnesota, of course, are very detailed. Intended for guidance of the legislature, the report is highly factual and impartial, so much so that an uninformed person might decide anything from it. It is not surprising that the legislature continued bounties after receiving this report. As pointed out in the paper, one big reason bounties are perpetuated despite opposition of most experts is that many individuals benefit financially from them.

Ricker, W. E. NUMERICAL RELATION BETWEEN ABUNDANCE OF PREDATORS AND SURVIVAL OF PREY. Canadian Fish Culturist (Dept. of Fisheries, Ottawa), Issue 13: 5-9 p. Dec. 1952.
A mathematical study of the effect of predation under different circumstances and at different levels. The paper appears to be an important contribution to understanding of predation dynamics and should be studied by all concerned with predation theory. Among other things, it points out that when original survival of a prey species is low, quite moderate reduction in predators may cause marked improvement.

Robinson, Weldon B. POPULATION TRENDS OF PREDATORS AND FUR ANIMALS IN 1080 STATION AREAS. Journal of Mammalogy 34(2): 220-227. May 1953.
In the plains and deserts of the West, where 1080 stations have been used extensively, coyotes are now about ¼ as numerous as they were a decade ago, but bobcats and other small fur-bearers have markedly increased. Partly because they are widely spaced, 1080 stations are more selective than traps or coyote-getters.

Stullken, Donald E., and Charles M. Kirkpatrick. A DETERMINATION OF HOLE SIZES WHICH EXCLUDE CERTAIN PREDATORY MAMMALS. Journal of Wildlife Management 17(2): 124-128. April 1953.
See Kirkpatrick, WR 70:14.

Tevis, Lloyd, Jr. EFFECT OF VERTEBRATE ANIMALS ON SEED CROP OF SUGAR PINE. Journal of Wildlife Management 17(2): 128-131, illus. April 1953.
"To summarize the effect of vertebrates on the 1951 seed crop of sugar pine at Lake Almanor: closed cones on trees were cut by pine squirrels and slashed by white-headed woodpeckers; seeds were extracted from open, pendulous cones by Steller jays and from open ones on the ground by white-breasted nuthatches, red-breasted nuthatches, and mountain chickadees; and shed seeds were hunted in litter by chipmunks, white-footed mice, and, to a lesser extent, mantled squirrels. It appeared that almost no seeds survived from the estimated potential crop of 380,880. I would not expect to find a seedling of sugar pine under any of the marked trees in the spring of 1952."

WILDLIFE--MANAGEMENT--PREDATION, CROP DAMAGE, AND CONTROL--Continued

West, G. A. OPERATIONS OF PREDATOR-CONTROL BRANCH, 1951. Report of Proceedings, 6th Annual Game Convention, Vernon, B. C., May 7-10, 1952. British Columbia Game Department, Victoria, B. C. 87-90 p. 1952.

WILDLIFE--REPORTS OF ORGANIZATIONS

Anonymous. FEDERAL AID IN FISH AND WILDLIFE RESTORATION: ANNUAL REPORTS OF THE DINGELL-JOHNSON AND PITTMAN-ROBERTSON PROGRAMS FOR THE FISCAL YEAR ENDING JUNE 30, 1952. Wildlife Management Institute and Sport Fishing Institute, Washington 5, D. C. 1-72 p., illus. 1952?

Reviews some project accomplishments (12 p.), lists projects of each state and their costs (39 p.), gives financial statements (10 p.), and shows acreage approved for purchase by each state during fiscal year.

British Columbia. PROVINCIAL GAME COMMISSION REPORT FOR THE YEAR ENDED DECEMBER 31ST 1951. Department of Attorney-General, Victoria, B. C. 1-95 p. 1952.

Contains much useful information on status of different species of game and fur-bearers in regions of the province, game management and research, bounties paid 1922-51, predator control, game bird stocking, and harvests of fur-bearers (by species) 1921-51. Surveys of pheasant populations and reproduction (1948-51) are reported. More liberal seasons for blue and ruffed grouse are recommended. Moose overpopulations occur in certain areas and those herds should be reduced. Control of pumas, wolves and coyotes is being pressed strongly by use of 1080 stations, air-dropped baits, cyanide guns, and other means. Effectiveness of these measures is reflected in fewer bounty claims. Many other kinds of "vermin" are destroyed by wardens. Two instances of pumas attacking people are recorded.

British Columbia. REPORT OF PROCEEDINGS, 6TH ANNUAL GAME CONVENTION, VERNON, B. C., MAY 7-10, 1952. British Columbia Game Department, Victoria, B. C. 1-212 p., graphs. 1952.

Contains several prepared papers on game and fisheries and transcripts of discussions on many conservation topics. Game papers are listed separately in this issue of WR. Discussions of numerous resolutions were participated in by wildlife experts, sportsmen, trappers, guides, and cattlemen. The volume as a whole gives a good picture of the status, problems, and practice of wildlife management in the Province.

Casey, Ivan. ANNUAL REPORT OF THE DEPARTMENT OF LANDS AND FORESTS OF THE PROVINCE OF ALBERTA FOR THE FISCAL YEAR ENDED MARCH 31ST 1952. A. Shnitka, King's Printer, Edmonton. 1-89 p., illus. 1952.

Report of the fish and game commissioner (p. 46-55) includes: brief review of game and fur conditions; bounties paid on wolves and cougars; wild fur production and its value, by species. Deer are decreasing, but moose and elk are still increasing. "Surveys showed an increase of 50% in migratory waterfowl returning from the south to nesting areas. Surveys also showed an 88% increase in brood stock over the previous year. The population of upland birds, particularly chicken and ruffed grouse has shown a steady increase and we can expect the peak of the upland bird cycle to be reached in 1952." Upland birds therefore should be harvested heavily. Ten years ago beaver were on the verge of extermination; now the problem is one of removal. They are being moved from settled areas to registered trap line areas. 12,788 were pelted, 1951-52.

Chapman, Oscar L. ANNUAL REPORT OF THE SECRETARY OF THE INTERIOR, FISCAL YEAR ENDED JUNE 30, 1952. U. S. Government Printing Office. v + 501 p., illus. 1953? $1.25 from Superintendent of Documents.

Reports of all bureaus of the department, including Reclamation, Land Utilization, Land Management, Fish and Wildlife, and National Parks. Report of Fish and Wildlife Service contains factual information, some not available elsewhere, on work of all divisions. The report gives data on Pribilof fur-seal industry, wildlife research projects, problems of public use of refuges, high-handed

WILDLIFE--REPORTS OF ORGANIZATIONS--Continued

trespass of military on refuges (with installations completed before permission requested), dangers of gas and oil developments on waterfowl refuges, predator and rodent control activities, river basin investigations and achievements, and international activities.

Conservation Foundation. ANNUAL REPORT FOR THE YEAR 1951. Conservation Foundation, 30 E. 40th St., N. Y. 16, N. Y. 1-35 p. No date. [1952?]
Program, activities, staff, finances. Fields in which the Foundation was active in 1951 were: analysis of human population trends, marine resource evaluation, conversion of salt water to fresh, watershed study, ground water, vegetation in relation to water yield, soil erosion in the Western Hemisphere, review of U. S. forest resources, Alaskan ecology, conservation legislation in Pennsylvania, Alaskan program analysis, and education. Several of the programs were handled in connection with or on behalf of governmental units.

Conservation Foundation. ANNUAL REPORT FOR THE YEAR 1952. Conservation Foundation, 30 E. 40th St., N. Y. 16, N. Y. 1-41 p. [1953.]
An interestingly written report telling of the Foundation's projects, accomplishments, publications, and films. In general, the aim of the Foundation is to provide authoritative, overall views of controversial problems of basic conservation importance, and to serve as a catalyst in the solution of these problems. Among its projects are studies of the role of vegetation in watershed management, flood control policies, water use in industry, conversion of salt water to fresh, soil erosion in Latin America, condition and management of U. S. forests, potentials of marine resources, ecology of larger Alaskan mammals, development of Alaska, legal aspects of conservation, human population problems, and economics of land use. The Foundation has utilized various approaches to conservation education, including temporary support of programs at Yale and Harvard.

Gordon, Seth. FORTY-SECOND BIENNIAL REPORT OF THE DEPARTMENT OF FISH AND GAME FOR THE YEARS 1950-1952. California Department of Fish and Game. 1-187 p., illus. Jan. 1953.
Includes information on: how cooperative hunting areas work; waterfowl management areas for reduction of crop damage; land management projects; estimated kill, 1948-50, of 10 types of game; licensed private game bird clubs; land acquisition; P-R projects (each concisely described); disease studies; special hunts; game breeding (being restricted); and predator control. Tables in appendix give statistics on cooperative hunting area operations, waterfowl management area operations, controlled hunts, deer kill (by counties) 1947-51, game bird releases, catch of predators (by counties) 1950-51, and mountain lions bountied (by counties) 1947-51. Appendix also contains statement of deer management policy, and detailed reorganization plan for department.

Indiana. ANNUAL REPORT FOR THE DIVISION OF FISH AND GAME, INDIANA DEPARTMENT OF CONSERVATION, FOR THE YEAR 1950. [Reprinted from] Yearbook of the State of Indiana 1950. 643-661 p. 1950.
Includes brief accounts of wildlife research, management, demonstration, and propagation projects. "A study of the fox bounty system in Indiana has just been completed and includes all available records collected from counties paying bounties during the past 40 years. Bounty payments for control of foxes have amounted to a quarter of a million dollars during this period. It is evident that the fox population in Indiana fluctuates at ten-year intervals, and bounty payments have done little to control these fluctuations."

Indiana. ANNUAL REPORT FOR THE DIVISION OF FISH AND GAME, INDIANA DEPARTMENT OF CONSERVATION, FOR THE YEAR 1951. [Reprinted from] Yearbook of the State of Indiana 1951. 1-22 p. 1951.
Includes brief accounts of wildlife research, management, demonstration, and propagation. The Wildlife Habitat Restoration Project "was started in 1941 and on most of the older leases, the owners report as much as 100% increase in wildlife on their farms." Increases in license fees made possible increase of warden force from 86 to 102.

WILDLIFE--REPORTS OF ORGANIZATIONS--Continued

Indiana. ANNUAL REPORT FOR THE DIVISION OF FISH AND GAME FOR THE YEAR 1952. Indiana Department of Conservation, 13 unnumbered p., mimeo. 1952.
Lists properties and projects and gives figures on pheasant, quail, rabbit, and fish releases, as well as on arrests and finances.

International Union for the Protection of Nature. PROCEEDINGS AND PAPERS OF THE TECHNICAL MEETING HELD AT THE HAGUE, 20, 21 and 22 SEPTEMBER 1951. International Union for the Protection of Nature, 42 rue Montoyer, Brussels. 1-105 p., illus. 1952.
Consists of discussion summaries and several prepared papers (mostly in English, some in French). The 2 major topics on which papers center are: 1. Planning and management of rural and village areas in heavily populated regions for maximal preservation and encouragement of the biota. 2. Problems and management of nature preserves. Less space is devoted to the wild animal trade and to the alarming decrease of whales. The approach throughout is on a world basis, though special areas are considered. The outlook of contributors is scientific and realistic.

Michigan. THE DEPARTMENT OF CONSERVATION, SIXTEENTH BIENNIAL REPORT, 1951-52. Lansing, Mich. 1-232 p., illus. No date. [1953?]
Report of Game Division (p. 141-171) contains much interesting and important information presented concisely in tables and text. Leading subjects are: management and studies in the game districts; land acquisition (nearly 63,000 acres in biennium); habitat improvement on state and private lands; research at 4 wildlife experiment stations; disease research; game farm (production curtailed); status and management of the various game and predator species; pheasant harvest, 1937-51; fur harvest, by species, 1946-52; small game harvest, by species, 1946-52; extension work.

Montana. BIENNIAL REPORT OF THE FISH AND GAME COMMISSION FOR MAY 1, 1950--APRIL 30, 1952. Montana Fish and Game Department, Helena. 1-63 p., illus. No date. [Jan. 1953.]
Report on wildlife restoration (p. 18-29) contains brief but informative statements on numbers, status, and management of many animals. Antelope hunting, almost unknown ten years ago, is now a major sport. Grizzlies are being encouraged in back country areas by discontinuance of spring hunting and establishment of a pattern of closures. Deer have responded well to transplanting, especially in the last 5-6 years. Much winter elk range has been purchased. In lieu of taxes, the Commission pays 5¢ per acre for all game lands. Several plantings of mountain goats have succeeded. Regulated, either-sex hunting of moose has widened the range. Mountain sheep, still scarce, are being transplanted and at least 1 new colony has succeeded. Pheasant population trends, 1942-52, are graphed. Waterfowl are being studied and breeding areas are being acquired for development. A table shows numbers and pelt values of 12 fur-bearers harvested in the biennium. Legal permission for bigger beaver harvest is needed. Game farms are producing about 33,500 pheasants and 670 chukars annually. These birds are released where absent or depleted.

New Jersey. ANNUAL REPORT, NEW JERSEY DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT, DIVISION OF FISH AND GAME, FOR THE FISCAL YEAR COMMENCING JULY 1, 1951 AND ENDING JUNE 30, 1952. Trenton, N. J. 1-55 p. [1953.]
Includes: figures on pheasants and quail reared and released, and on rabbits purchased and released; statement of work done in habitat improvement; brief description of measures taken to control deer damage; figures (by counties) on deer harvest; report (by counties) of 212 beaver taken in first open season; numbers killed of "predatory vermin" of 17 types.

New Mexico. ANNUAL REPORT, DEPARTMENT OF GAME AND FISH, JULY 1, 1951 - JUNE 30, 1952. 1-18 p., illus. No date. [1953.]
Game conditions, results of hunting various types of game, trapping and transplanting upland game birds, game farm operations, beaver control, predator control.

WILDLIFE--REPORTS OF ORGANIZATIONS--Continued

North Dakota. ANNUAL REPORT NORTH DAKOTA GAME AND FISH DEPARTMENT, JULY 1, 1951 TO JUNE 30, 1952. Bismark, N. D. 1-57 p., illus. No date. [1953?]
Reviews accomplishments of the previous 4 years, and shows how income of the department varies directly with game populations through license sales. Wardens have become educators to a much greater extent than before and public relations otherwise have been improved. Harvest of beavers has increased to 2,536; in the future they will be taken during an open season instead of on permit. PR projects are reviewed, with data given on: waterfowl production and harvests; status of fur bearers; pelt prices (1950-51); fur harvests, by species (1948-51); status and harvests of big game; pheasant sex ratios, 1949-52 (more cocks should be shot); status and harvests of upland game birds (1950-51).

Nova Scotia. REPORT OF THE DEPARTMENT OF LANDS AND FORESTS 1951. Halifax, N. S., Queens Printer. 1-82 p., illus. 1952.
The section on wildlife (p. 49-65) includes: general statements on status of moose, deer, small game, and wild fur-bearers; detailed reports on deer kill 1916-51, moose kill 1908-37, bear bounties paid, beavers trapped, furs exported, and numbers of ranch fur-bearers. Moose are still low but slowly increasing. Moose sickness seems scarcer and is being studied. Deer are abundant and increasing; 42,343 were killed in 1951. Two deer of either sex may be killed, but the annual surplus is not yet being taken. Snowshoe hares increased in 1951. There is a small but fairly stable population of Hungarian partridges in more open agricultural areas. Pheasants are being stocked and are increasing; more than 3,000 were shot in 1951. Bear, wildcat, fox, and raccoon are not protected.

Oregon. 1951-1952 BIENNIAL REPORT OF THE OREGON STATE GAME COMMISSION. State Game Commission, Portland 8, Ore. 1-48 p., illus. No date. [1953.]
Not to be confused with the annual reports of the game division, which are comprehensive accounts of game conditions. This biennial report of the commission is an attractive administrative summary. It includes discussions of: estimates of the cash value of Oregon's wildlife; history and administration of wildlife in state; management and harvests of big game; habitat improvement for upland game birds, waterfowl, and big game; status of doves, pigeons, and snipe; status and harvests of fur bearers; numbers of predators killed; reduction in game farming because of poor survival of released birds; status and management of various upland game birds; handling and values of game management areas; river basin investigations; and cooperative research unit projects.

Patton, Clyde P. THIRD BIENNIAL REPORT OF THE STATE OF NORTH CAROLINA WILDLIFE RESOURCES COMMISSION, BIENNIUM BEGINNING JULY 1, 1950 AND ENDING JUNE 30, 1952. 1-68 p., illus. 1952.
Report of the game division (p. 48-65) includes discussions of: upland game restoration, development of U. S. Forest Service areas, big game restoration, Orton Waterfowl Development Area, fur resources investigation, waterfowl resources investigations, mourning dove study, land acquisition and leasing, raccoon restoration in western N. C., descriptive list of wildlife management areas in state, work on Sandhills Management Area, results of hunts at Mattamuskeet Refuge, deer hunting statistics for Holly Shelter Management Area, and hunting statistics for various forms of game bagged in managed hunts on Pisgah and Nantahala National Forests.

Saskatchewan. ANNUAL REPORT OF THE DEPARTMENT OF NATURAL RESOURCES OF THE PROVINCE OF SASKATCHEWAN FOR THE FISCAL YEAR ENDED MARCH 31, 1952. Thos. H. McConica, Queen's Printer, Regina. 1-168 p., illus. 1952.
Report of the game branch (90-120 p.) discusses fur animal programs, status and kill of game birds and animals, and predator control. Research problems are outlined. Graphs show numbers of muskrats, weasels, beaver, and mink harvested 1920-1952. Tables show: game kill (by species) 1951-52, wild fur harvest and its value (by species) 1950-52, and wild fur production (by species) 1944-52. Moose were increasing but not yet plentiful enough for a general open season. Caribou were decreasing; sport hunting for them was stopped. Control

WILDLIFE--REPORTS OF ORGANIZATIONS--Continued

of coyotes, wolves, crows, and magpies was pressed vigorously. Coyotes became scarce in many localities. An interesting technique in wolf control is to place poisoned baits well out on frozen lakes crossed by wolf routes. This saves many small fur-bearers from being poisoned. Upland game birds, including Hungarian partridge, were on cyclic upswing. Pheasants, however, were scarce in the Province.

Wisconsin. TWENTY-THIRD BIENNIAL REPORT OF THE STATE CONSERVATION COMMISSION OF WISCONSIN FOR THE FISCAL YEARS ENDING JUNE 30, 1951 AND JUNE 30, 1952. Madison, Wis. 1-132 p., illus. 1952.

Report on game management (51-77 p.) includes data on: size and location of public hunting and fishing grounds; cost of winter deer feeding and deer yard acquisition; bounties paid; deer and bear damage claims paid; game propagation and transplanting; Horicon Marsh development; and other acquisition and development projects. There are also rather detailed summaries of: deer management research (includes figures on condition of yards and on age composition of deer shot); waterfowl management research (includes hunting statistics); pheasant and quail research; studies of various grouse; fur animal research (beavers, Horicon muskrats); wildlife pathology work, and game survey project.

Wyoming. ANNUAL REPORT, 1951, THE WYOMING GAME AND FISH COMMISSION. Cheyenne, Wyo. 1-80 p., illus. No date. [1953?]

An attractive and informative report. As shown by graphs, big game licenses and big game kill have fluctuated together, increasing greatly since the war. With a few local exceptions, herds have withstood the huge kills in good shape. In the future it may be necessary to institute more protective measures of types now successfully used for scarce species. Data are given on kills in each year, 1942-51, of each species of big game, and on the habits of each species. Figures and other information are given on big game damage (paid for by state), cost of elk feeding, numbers of each species of big game in state (1948-51), beaver harvest (1942-51), predator control, 1951 game bird harvest (by species), and pen reared birds released. Each PR research and management project is briefly described.

MAMMALS--GENERAL

Beidleman, Richard G. A PARTIAL BIBLIOGRAPHY OF TECHNIQUES IN MAMMALOGY. Rocky Mountain Nature Association, Estes Park, Colo. i + 76 p., mimeo. 1951. 75¢ from Naturalist Office, Rocky Mt. Nat. Park, Colo.

This list of some 1500 references on techniques should save much time and be of real value. Titles are grouped under the following headings:

- Identification:
  - Age, sex and reproduction
  - Bones and teeth
  - Hair
  - Miscellaneous
  - Scat
  - Tracks
- Life history studies
- Mammal capture
- Mammal control
- Mammals in captivity
- Mammal photography
- Mapping
- Miscellaneous references
- Population studies:
  - Censusing
  - Gen. population studies
  - Home range
  - Marking
- Preparation and preservation

Christian, John C. THE RELATION OF ADRENAL WEIGHT TO BODY WEIGHT IN MAMMALS. Science 117(3030): 78-80, graph. Jan. 23, 1953.

All species studied fall on virtually the same straight line when body weight is plotted against adrenal weight on log-log scales. "The outstanding fact that these data show is that the adrenal gland weight follows a definite logarithmic relationship to body size for all species examined, and that this relationship parallels that in a single species (Rattus) over a wide age and weight range."

MAMMALS--GENERAL--Continued

Conroy, K. E. AN ACCOUNT OF SOME PHYSICAL PROPERTIES OF CARIBOU AND SEAL SKINS. Canada. Defence Research Board. Chemical Laboratories Report no. 68. ii + 16 leaves, illus. 1951. [From Polar Record 6(45).]
"Methods and results of tests; part of investigations into clothing design for extreme cold."

Hall, E. Raymond, and Keith R. Kelson. COMMENTS ON THE TAXONOMY AND GEOGRAPHIC DISTRIBUTION OF SOME NORTH AMERICAN MARSUPIALS, INSECTIVORES AND CARNIVORES. University of Kansas Publications, Museum of Natural History, 5(25): 319-341. Dec. 1952.
The discussions and proposed changes pertain to Didelphis, Caluromys, Scalopus, Sorex, Blarina, Spilogale, Conepatus, Urocyon, and Canis. All North American Didelphis are considered races of D. marsupialis. Some nominal species of Spilogale are eliminated or treated as subspecies. Reduction in number of nominal species is an important feature of reviews being published by Hall and his coworkers. The resulting simplification should be welcome to wildlife biologists.

Hoffmeister, Donald F. A PLEA FOR UNIFORMITY OF COMMON NAMES OF MAMMALS. Journal of Mammalogy 34(2): 285. May 1953.
Urges that all common names used in Burt's recent Field Guide to the Mammals be adopted as standard by mammalogists. These names are listed on pages xvii-xxi of the Field Guide.

Quick, Horace F. OCCURRENCE OF PORCUPINE QUILLS IN CARNIVOROUS MAMMALS. Journal of Mammalogy 34(2): 256-259. May 1953.
Studies near Ft. Nelson, British Columbia, and observations in Maine gave a number of records, which are discussed. Apparently porcupines may be attacked by almost any predator, although certain species and individuals probably are especially prone to make such attacks. Insertion of quills is not especially painful. Quills in the body are not necessarily lethal; they tend to be dissolved, absorbed, or passed in feces, and some work out through the skin.

Rodbard, Simon. WEIGHT AND BODY TEMPERATURE IN MAMMALS. Science 117(3036): 256-257. March 6, 1953.
Gives many data to show that a previously described weight-temperature relationship is valid. Stresses need of using basal (resting) temperatures in comparisons. 29 references.

MAMMALS--FAUNAS AND MANUALS

Blair, W. Frank. A CONTRIBUTION TO THE ECOLOGY AND FAUNAL RELATIONSHIPS OF THE MAMMALS OF THE DAVIS MOUNTAIN REGION, SOUTHWESTERN TEXAS. University of Michigan, Museum of Zoology, Miscellaneous Publication no. 46. 1-39 p., illus. June 1940. 35¢.
Chiefly an annotated list of mammals. Includes brief descriptions of the biotic associations, with lists of mammals found in each, and brief discussion of biogeographic relationships of the region.

Burt, William Henry. FAUNAL RELATIONSHIPS AND GEOGRAPHIC DISTRIBUTION OF MAMMALS IN SONORA, MEXICO. University of Michigan, Museum of Zoology, Miscellaneous Publication no. 39. 1-77 p., maps. Feb. 1938. 75¢.
Includes discussion of biotic provinces and has notes on ecology and taxonomy of species and subspecies.

Conaway, C. H., and J. C. Howell. OBSERVATIONS ON THE MAMMALS OF JOHNSON AND CARTER COUNTIES, TENNESSEE, AND AVERY COUNTY, NORTH CAROLINA. Report of Reelfoot Lake Biological Station 17: 53-61. (Same as J. Tenn. Acad. Sci. 28(1): 53-61.) Jan. 1953.
Annotated list of species with data on local distribution, measurements, and reproduction.

MAMMALS--FAUNAS AND MANUALS--Continued

Connor, Paul F. NOTES ON THE MAMMALS OF A NEW JERSEY PINE BARRENS AREA. Journal of Mammalogy 34(2): 227-235. May 1953.
Annotated list, with brief descriptions of 10 habitats trapped, and a table of numbers of small mammals trapped in each.

Coulter, Malcolm W. BIG GAME AND FUR-BEARING ANIMALS OF MAINE. Maine Extension Bulletin 425. 1-32, illus. Dec. 1952.
An educational pamphlet, but of technical value for its data on status and distribution in Maine. Each species is treated under the following headings: description, range, distribution and abundance in Maine, habits, food, reproduction, and remarks. Bears are bountied. Caribou are exterminated. Fishers have come back and are now legally trapped. Martens are scarcer and still protected. Otters are increasing, generally common. The lynx is rare, only a few in remote areas.

Findley, James S., and Norman C. Negus. NOTES ON THE MAMMALS OF THE GOTHIC REGION, GUNNISON COUNTY, COLORADO. Journal of Mammalogy 34(2): 235-239. May 1953.
Annotated list, with table showing relative availability to trapping of small mammals of 3 habitats.

Hediger, H. GAME ZOOLOGY--ALSO FOR NON-HUNTERS (Jagdzoologie--auch für Nictjäger). Verlag Friedrich Reinhardt A. G. Basel. 212 p., illus. 1951. [From review by H. W. Levi, Journal of Wildlife Management 17(1).]
"The book consists of a number of chapters on different mammals of Switzerland, written, like other Hediger publications, in a most fascinating manner. Peculiarities of behavior, life history and physiology of the mammals are recited and illustrated by many, probably original, observations and anecdotes on wild and captive animals. The book is a mine of information on Swiss game animals." "...the book was written to make hunters aware of their responsibility as guardians of game."

Johnson, Murray L., and Sherry Johnson. CHECK LIST OF MAMMALS OF THE OLYMPIC PENINSULA. Murrelet 33(3): 32-37. Sept.-Dec. 1952.
Includes notes on abundance and habitats.

Sanderson, Ivan T. HOW TO KNOW THE AMERICAN MAMMALS. Little, Brown & Co., Boston. 1-164 p., illus. 1951.
This little book may have some use but it is difficult to think what. It is too brief and general for the naturalist; too brief and too laden with nonessential descriptive material for the layman. It does not serve for identification of our mammals, though of course some could be recognized from the illustrations. Larger mammals are taken up mainly by species, smaller ones by genera. For most species or genera there are notes on distribution, appearance, and habits. The 9 lines devoted to fox squirrels discuss nothing but geographic variation. The large genera Peromyscus and Perognathus are dismissed with 44 and 23 lines; treatment of other small mammals is comparable.

MAMMALS--COMMUNITIES, NUMBERS, HOME RANGES

Calhoun, John B., and William L. Webb. INDUCED EMIGRATIONS AMONG SMALL MAMMALS. Science 117(3040): 358-360, graphs. April 3, 1953.
Heavy kill trapping over large areas in Maine and New York apparently caused much influx into trapped areas. "The number of invaders in Maine during the first 23 days was five times that of the calculated original resident population." The comparable figure for the N. Y. locality was 2.3, although the population was higher. The explanation is believed to be movement of animals from increasingly great areas into the "biological vacuum." Different results that have been obtained on areas of but a few acres are attributed "to the ability of the animals to detect others across the smaller depleted area."

MAMMALS--COMMUNITIES, NUMBERS, HOME RANGES--Continued

Tanaka, Ryo. BEHAVIOR-RANGES AND POPULATIONS OF SOME RATS AND MICE. Seibutu 4(1): 16-20. 1949.
Japanese with English summary.

Tanaka, Ryo. ESTIMATION OF VOLE AND MOUSE POPULATIONS ON MT. ISHIZUCHI AND ON THE UPLANDS OF SOUTHERN SHIKOKU. Journal of Mammalogy 32(4): 450-458. 1951.
Live trapping studies were made to determine populations and home ranges. Population size was estimated by use of an equation involving a mark-and-release index, designed to take account of different trap response of marked and unmarked animals.--L. F. Stickel.

Tanaka, Ryo. FURTHER STUDY ON VOLE AND MOUSE POPULATIONS ON MT. ISHIZUCHI. Annotationes Zoologicae Japonenses. 25(1-2): 279-283. 1952.

Tanaka, Ryo. THEORETICAL JUSTIFICATION OF THE MARK-AND-RELEASE INDEX FOR SMALL MAMMALS. Bulletin Kochi Women's College, 1: 38-47. 1952.
Field data on several kinds of small mammals are included.

MAMMALS--PARASITES AND DISEASES

Grondahl, C. R. THE 1951-52 OUTBREAK OF RABIES IN NORTH DAKOTA. Bimonthly Bulletin, North Dakota Agricultural Experiment Station, 15(4): 139-145, maps and graph. March-April 1953.
Includes information on occurrence in wild mammals.

Hendricks, Stanley L., and H. U. Garrett. RABIES IN IOWA. Journal of the American Veterinary Medical Association 122(915): 474-478, graphs and map. June 1953.
Occurrence in animals of state, 1905-51, and occurrence by species of wild or domestic mammal, 1949-51. All-time peak was in 1950-51. Many suspected animals were negative on examination for Negri bodies, but positive on mouse test. Skunks were the most commonly infected wild animals. "While dog rabies can be controlled, methods must be devised so that the reservoir of the disease in wild animals can also be eliminated in order to obtain eventual eradication of rabies."

Jellison, William L. ANOPLURA FROM MAMMALS OF THE PRIBILOF ISLANDS. Journal of Parasitology 38(3): 274-275. June 1952.
List of species found on fur seal, sea lion, and fox.

Moll, T., and C. A. Brandly. BOTULISM IN THE MOUSE, MINK, AND FERRET WITH SPECIAL REFERENCE TO SUSCEPTIBILITY AND PATHOLOGICAL ALTERATIONS. American Journal of Veterinary Research 12(45): 355-363, illus. Oct. 1951.

Rausch, Robert. HYDATID DISEASE IN BOREAL REGIONS. Arctic 5(3): 157-174, illus. Oct. 1952.

Royal, Orren L. A PRELIMINARY SURVEY OF THE INSECT ECTOPARASITES OF THE MAMMALS OF ALABAMA. Masters thesis, University of Alabama, 1952.
Twenty-six species of mammals were collected in Alabama and studied for insect ectoparasites. Twenty-five species of insect ectoparasites were recorded from the hosts, eleven of which represent new state records. Information on host specificity and relative abundance is presented.--R. L. Chermock.

Sweatman, Gordon K. DISTRIBUTION AND INCIDENCE OF ECHINOCOCCUS GRANULOSUS IN MAN AND OTHER ANIMALS WITH SPECIAL REFERENCE TO CANADA. Canadian Journal of Public Health 43: 480-486, maps. Nov. 1952.
Review of literature and other records. The disease is chiefly one of moose and wolf.

MAMMALS--CONTROL, MORTALITY

Atkeson, Thomas Z., and David C. Hulse. TRAPPING VERSUS NIGHT HUNTING FOR CONTROLLING RACCOONS AND OPOSSUMS WITHIN SANCTUARIES. Journal of Wildlife Management 17(2): 159-162. April 1953.

Both methods were tested on the Wheeler Refuge, Ala. Hunting was done with dogs but without axes or guns. Trapping was with steel traps and was done by 15 men. Both hunting and trapping seasons and methods were those legal in Ala. Hunting proved far more effective, caused less loss of young or protected animals, caused less disturbance of waterfowl (because of time of year), resulted in less crippling, was more humane, provided more sport for more people, and meat taken by hunting was well utilized while that taken by trapping was not. Circumstances elsewhere might not favor hunting as much as they did in these trials.

MAMMALS--SHREWS, MOLES, BATS

Mumford, Russell E. BAT BANDING IN INDIANA CAVES. Outdoor Indiana 20(1): 7-10, illus. Jan. 1953.

General, popular account.

MAMMALS--RABBITS AND PIKAS

Burnet, Frank MacFarlane. MYXOMATOSIS AS A METHOD OF BIOLOGICAL CONTROL AGAINST THE AUSTRALIAN RABBIT. American Journal of Public Health and the Nation's Health 42(12): 1522-1526. Dec. 1952.

Tells the story of this induced epizootic with emphasis on its epizootiology. In some areas the kill was 99.5% and 25-50% of the rabbit population may have been destroyed. Now over half the rabbits of certain regions are immune.

Francine, Jock. [STOCKING HARES AND RABBITS IN NEW JERSEY.] New Jersey Outdoors 3(8): 20. Feb. 1953.

"The last of 20,000 cottontails are arriving in New Jersey these days for restocking open lands. These bunnies were purchased by the Division in Missouri where 201,106 rabbits were taken by trappers and sold in the wild rabbit trade. Missouri hunters, by the way, bagged 3,688,424 denizens of the briar patch in the open season during 1951 and 1952.....While on the subject of bunnies--we've got some more 'bonus bunnies' arriving--white-tailed Jack rabbits from Kansas and black-tailed Jacks from Wyoming. They really fill the stewpot! These jet-propelled mammalia will be liberated in open areas where they can depend on their tremendous speed for protection as they do in their native West. In certain sections of Jersey hunters drive'em like they do deer. One Cactus Jack can keep a host of nimrods pretty well occupied once he's flushed..."

Harper, Arthur R. THE COTTONTAIL RABBIT IN OHIO. Ohio Department of Natural Resources, Division of Wildlife, Educational Booklet no. 1. 1-24 p., illus. 1952. [Appearing in parts in Ohio Cons. Bul., beginning Feb. 1953.]

Popular, nontechnical pamphlet that discusses biology and habitat requirements, tells what management methods can be applied, and stresses the need of improved hunter-farmer relationships and cooperation for management.

Hubbard, Fred H. PRODUCTIVITY OF THE COTTONTAIL RABBIT, SYLVILAGUS FLORIDANUS MEARNSII (ALLEN), IN DECATUR COUNTY, IOWA, 1951. M. S. thesis, Iowa State College. 1952.

Hubbard, Fred H., and George O. Hendrickson. PRODUCTIVITY OF THE COTTONTAIL RABBIT IN DECATUR COUNTY, IOWA, 1951. Iowa Academy of Science 59: 457-460. 1952.

"In summary, on a 75-acre tract bearing 37 per cent cultivated crops and 63 per cent untilled cover in Decatur County, Iowa, a maximum seasonal breeding stock of 35 cottontails was determined with trapping, tagging and retrapping techniques, and flush counts. On the basis of 83 trapped, measured and tagged juveniles, assigned to 29 litters, an estimated 145 young were born between March 28 and September 6. Retrapping data indicated that 60 of the young cottontails remained on the area September 19. The productivity as of that date was 171 per cent of the breeding stock of 35 adult cottontails."

MAMMALS--RABBITS AND PIKAS--Continued

Stieve, H. [REPRODUCTION OF THE EUROPEAN HARE] ZUR FORTPFLANZUNGSBIOLOGIE DER EUROPÄISCHEN FELDHASEN (LEPUS EUROPAEUS PALLAS). Zool. Anzeiger (Leipzig) 148: 101-114. March-April 1952. [From Journal of Mammalogy 34(2).]

Thompson, Harry V. THE GRAZING BEHAVIOR OF THE WILD RABBIT, ORYCTOLAGUS CUNICULUS (L.). British Journal of Animal Behavior 1(1): 16-19. Jan. 1953.
Effect of rabbits on natural and cultivated vegetation; behavior during feeding periods; times of feeding; effect of rain, temperature, wind, and snow on behavior; notes on certain plants eaten or avoided.

Tyndale-Biscoe, C. H. A METHOD OF MARKING RABBITS FOR FIELD STUDIES. Journal of Wildlife Management 17(1): 42-45. Jan. 1953.
Describes use of an aluminum rivet and washer to fasten on numbered, plastic ear tags. The rivet goes through a round, punched hole in the ear and is more satisfactory and less irritating than other fasteners.

MAMMALS--RODENTS--MISCELLANEOUS

Barkalow, Frederick S., Jr. LIFE HISTORY AND ECOLOGIC OBSERVATIONS ON THE TUNDRA MOUSE (MICROTUS OECONOMUS) AND LEMMINGS (LEMMUS TRIMUCRONATUS AND DICROSTONYX GROENLANDICUS) AT BARTER ISLAND, ALASKA. Journal of the Elisha Mitchell Scientific Society 68(2): 199-205, illus. Dec. 1952.
Notes on habits, nests, reproduction, and on predation of snowy owl on Lemmus.

Blair, W. Frank. EXPERIMENTAL EVIDENCE OF SPECIES DISCRIMINATION IN THE SYMPATRIC SPECIES, PEROMYSCUS TRUEI AND P. NASUTUS. American Naturalist 87(833): 103-105. March-April 1953.
Captives tend to pair with members of their own species. This is thought to be the principle mechanism that keeps the species distinct in nature.

Clarke, J. R. THE EFFECT OF FIGHTING ON THE ADRENALS, THYMUS AND SPLEEN OF THE VOLE (MICROTUS AGRESTIS). Journal of Endocrinology 9: 114-126. 1953.
Author's summary: "1. An attempt has been made to put Chitty's hypothesis, which explains population cycles in the vole (Microtus agrestis) [Chitty, 1952], to an experimental test by studying the effect of fighting on these animals. 2. When strange voles are added to a cage containing a pair of 'resident' voles, the strangers are viciously attacked by the residents. As a result of these attacks there is a pronounced increase in the weight of the adrenal glands and the spleen, and a decrease in the weight of the thymus, of the strange voles. The observed weight changes in these organs were statistically significant. 3. The weight changes in the adrenals and in the thymus of the strange voles can be explained by assuming a disturbance of the adreno-pituitary system of the animals concerned. Interpretation of the increased weight of the spleen is less straightforward, but the enlargement may indicate that the weakened condition of the strange voles enabled a pathogenic organism to become invasive."

Cockrum, E. Lendell, and Kenneth L. Fitch. GEOGRAPHIC VARIATION IN RED-BACKED MICE (GENUS CLETHRIONOMYS) OF THE SOUTHERN ROCKY MOUNTAIN REGION. University of Kansas Publications, Museum of Natural History, 5(22): 281-292, map. Nov. 1952.
Characters and distribution of 6 races of C. gapperi in region.

Curtis, James D., and Alvin K. Wilson. PORCUPINE FEEDING ON PONDEROSA PINE IN CENTRAL IDAHO. Journal of Forestry 51(5): 339-341, graphs. May 1953.
Quantitative data on injury to pole-size trees and factors affecting it. Cultural methods of lessening damage are recommended. It is pointed out that the porcupine is not and never has been protected in any state or province of North America.

MAMMALS--RODENTS--MISCELLANEOUS--Continued

Eadie, W. Robert. RESPONSE OF MICROTUS TO VEGETATIVE COVER. Journal of Mammalogy 34(2): 263-264. May 1953.
Bait placement tests in a ¼-acre plot revealed much less acceptance in a portion of the plot. Further study, and weighing of samples of vegetation, proved that areas of high bait acceptance had almost twice as much vegetation as areas of low acceptance. Results support the practice of reducing Microtus cover in orchards.

Evans, Florence L. UNUSUAL REPRODUCTIVE PHENOMENA IN RODENTS. Science 117(3033): 159-160. Feb. 13, 1953.
Records of rodents having 2 litters after 1 mating. Possible explanations are discussed.

Hall, E. Raymond, and E. Lendell Cockrum. COMMENTS ON THE TAXONOMY AND GEOGRAPHIC DISTRIBUTION OF NORTH AMERICAN MICROTINES. University of Kansas Publications, Museum of Natural History, 5(23): 293-312. Nov. 1952.
Concerns proper specific and subspecific allocation of various specimens or populations of Synaptomys, Clethrionomys, and Microtus (including Pitymys). Several taxonomic changes are proposed.

Hall, E. Raymond, and Keith R. Kelson. COMMENTS ON THE TAXONOMY AND GEOGRAPHIC DISTRIBUTION OF SOME NORTH AMERICAN RODENTS. University of Kansas Publications, Museum of Natural History, 5(26): 343-371. Dec. 1952.
Genera in which reidentifications or taxonomic changes are proposed are: Marmota, Spermophilus, Tamias, Sciurus, Thomomys, Geomys, Liomys, Perognathus, Dipodomys, Baiomys, Peromyscus, Sigmodon, Oryzomys, and Zapus. The gray squirrel of northeastern U. S. becomes S. carolinensis pennsylvanicus, with leucotis a synonym.

Hamilton, W. J., Jr. REPRODUCTION AND YOUNG OF THE FLORIDA WOOD RAT, NEOTOMA F. FLORIDANA (ORD). Journal of Mammalogy 34(2): 180-189, illus. May 1953.
Breeding, gestation period, suckling, growth and development, development of skull and teeth.

Hart, J. Sanford. THE RELATION BETWEEN THERMAL HISTORY AND COLD RESISTANCE IN CERTAIN SPECIES OF RODENTS. Canadian Journal of Zoology 31(2): 80-98, graphs. April 1953.

Hart, J. Sanford. ENERGY METABOLISM OF THE WHITE-FOOTED MOUSE, PEROMYSCUS LEUCOPUS NOVEBORACENSIS, AFTER ACCLIMATION AT VARIOUS ENVIRONMENTAL TEMPERATURES. Canadian Journal of Zoology 31(2): 99-105, graphs. April 1953.

Hart, J. Sanford. RATE OF GAIN AND LOSS OF COLD RESISTANCE IN MICE. Canadian Journal of Zoology 31(2): 112-116, graphs. April 1953.

Hart, J. Sanford. THE INFLUENCE OF THERMAL ACCLIMATION ON LIMITATION OF RUNNING ACTIVITY BY COLD IN DEER MICE. Canadian Journal of Zoology 31(2): 117-120, graphs. April 1953.

Hooper, Emmet T. TYPE LOCALITIES OF POCKET GOPHERS OF THE GENUS THOMOMYS. University of Michigan, Museum of Zoology, Miscellaneous Publications no. 52. 1-26 p., map. July 1941. 25¢.
Type localities of 266 forms are stated and mapped. Original publication is cited for each name.

Hooper, Emmet T. FAUNAL RELATIONSHIPS OF RECENT NORTH AMERICAN RODENTS. University of Michigan, Museum of Zoology, Miscellaneous Publications no. 72. 1-28 p. May 1949. 35¢.
Considers the genera and families that occur in each continent and zoogeographic realm of the world, with special attention to those common to various continents and realms. Sources and histories of the North American rodent groups are then discussed, with emphasis on major areas of differentiation, and interchange with South America.

MAMMALS--RODENTS--MISCELLANEOUS--Continued

Mirand, Edwin A., and Albert R. Schadle. GROSS ANATOMY OF THE MALE REPRODUCTIVE SYSTEM OF THE PORCUPINE. Journal of Mammalogy 34(2): 210-220, illus. May 1953.

Moore, J. E. NOTES ON THREE ADDITIONS TO THE RODENT FAUNA OF ALBERTA. Canadian Field-Naturalist 66(5): 142-143. Sept.-Oct. 1952.
Marmota flaviventris, Perognathus fasciatus, and Reithrodontomys megalotis.

Morrison, Peter R., and William J. Teitz. OBSERVATIONS ON FOOD CONSUMPTION AND PREFERENCE IN FOUR ALASKAN MAMMALS. Arctic 6(1): 52-57, graphs. March 1953.
Experiments with Citellus parryii, C. osgoodi, Clethrionomys rutilus, Dicrostonyx rubricatus, and Ochotona collaris kept in captivity and fed cultivated foods.

Nelson, W. O. "WARFARIN" AND ITS USE FOR CONTROL OF RODENTS. Ariz. Cattlelog 7: 39-41. Aug. 1952. [From Journal of Range Management 6(1).]

Nicholson, Arnold J., and Dwain W. Warner. THE RODENTS OF NEW CALEDONIA. Journal of Mammalogy 34(2): 168-179, illus. May 1953.
Includes information on ecology and reproduction of Rattus norvegicus, R. rattus, R. exulans, and Mus musculus. Evidence is given that the "races" of R. rattus are no more than color phases, at least on New Caledonia.

Pearson, Paul G. A FIELD STUDY OF PEROMYSCUS POPULATIONS IN GULF HAMMOCK, FLORIDA. Ecology 34(1): 199-207, maps and graph. Jan. 1953.
P. gossypinus and P. muttalli: population fluctuations (correlated with acorn production); longevity; range sizes (larger for males, smaller when population high); effects of changing water levels on ranges.

Schubert, G. H. A TRIAL OF THREE CHEMICALS AS RODENT REPELLENTS IN DIRECT SEEDING. U. S. Forest Service, California Forest and Range Experiment Station (Berkeley), Forest Research Notes no. 84. 1-2 p. Feb. 1953.
Red lead in dowax, zinc phosphide in dowax, and 1080 in asphalt or dowax did not protect forest seed from rodent attack. They did not effect germination detectably.

Tiner, Jack D. FATALITIES IN RODENTS CAUSED BY LARVAL ASCARIS IN THE CENTRAL NERVOUS SYSTEM. Journal of Mammalogy 34(2): 153-167. May 1953.
Report on rodents as intermediate hosts of ascarids of carnivores. Both natural and artificial infections may produce serious malfunction or death in rodents.

MAMMALS--HOUSE RATS AND MICE

Anonymous. EXTERMINATION OF RODENTS. Food Manufacture 27: 374. Sept. 1952. [From Public Health Engineering Abstracts 33(3).]
Use of dry ice to kill rodents in food plants. Enough dry ice to produce 20% concentration of CO_2 is broken to marble size and fan is directed at it. Rodents are said to come to the surface and die.

Fitzwater, William D., Jr. WARFARIN AND PERIMETER RODENT CONTROL. Food Technology 6: 436-438. Nov. 1952. [From Public Health Engineering Abstracts 33(3).]
Control of rodents at food plants. Stresses need for removal of harborage in plant and as far out around plant as possible. Gassing and poisoning should also be done outside. Directions are given for appropriate measures.

Tanaka, Ryo, and Fumio Kawashima. AN OUTBREAK OF COMMENSAL RATS IN THE ISLAND OF UGURU. Public Health Department of Kochi Prefecture. 1-15 p. 1946.
Japanese with English summary.

U. S. Public Health Service. 1953 COMMUNICABLE DISEASE CENTER RECOMMENDATIONS FOR THE USE OF INSECTICIDES AND RODENTICIDES. Pest Control 21(4): 9-10,12,14, 16,18, illus. April 1953.

MAMMALS--SCIURIDS

Barber, Harold L. KENTUCKY SQUIRREL STUDIES. BIOLOGISTS ARE FINDING OUT ABOUT HABITS OF BUSHYTAILS AND KNOWLEDGE WILL BE USED TO INCREASE POPULATIONS. Kentucky Happy Hunting Ground 9(2): 24-25, graph. March 1953.

This brief review of research results summarizes information on breeding seasons, includes a table of important fall foods, and discusses proper time to open shooting season. Season now opens August 25 when there is still much breeding. October 15 would be suitable opening date biologically (as graph shows) but hunters like to hunt in late August when hickory nuts are ripening and squirrels are most active. The big--and unanswered--question is: Would the annual harvest be increased by a later season?

Bertram, E. Cooper, and William L. Gault. KENTUCKY SQUIRRELS. Presented at 6th Annual Conference, Southeastern Association of Game and Fish Commissioners, Oct. 19-22, 1952, Savannah, Ga. 1-15 p. + 9 p. appendix, graphs. [Available from J. H. Jenkins, U. of Ga., Athens.]

Report of 2-year life history study and statewide hunter questionnaire surveys. Most data are on gray, some on fox squirrels. Information is given on breeding seasons, litter size, nest sites, sex ratios, parasites, and seasonal weights. Hunter survey yielded figures on total kill and on sex and age ratio of squirrels bagged. Census methods (leaf nest counts, cruise counts, and live trapping) gave conflicting results. No litters were produced on study area in spring of 1951, probably because of mast failure in previous fall and severe ice and snow storms during winter. Coccidiosis became serious at this time of malnutrition. During first part of hunting season, which opened Aug. 20, 97.2% of females were pregnant or lactating.

Evans, Everett F. GAME SQUIRRELS OF TEXAS: THE GRAY SQUIRREL. Texas Game and Fish 11(3): 13-14, 27. Feb. 1953.

General review of biology in state, with some interesting remarks on movements in relation to nut crops and in relation to wind.

Lyman, Charles P., and Paul O. Chatfield. HIBERNATION AND CORTICAL ELECTRICAL ACTIVITY IN THE WOODCHUCK (MARMOTA MONAX). Science 117(3046): 533-534. May 15, 1953.

Moran, Richard. A REFUGE SQUIRREL POPULATION IN SOUTHERN ILLINOIS. Presented at 14th Midwest Wildlife Conference, Des Moines, Iowa, Dec. 17-19, 1952. 1-7 p. 1952.

Based on 1951 and 1952 bag checks and live trapping at Crab Orchard Refuge. Data are given on hunter success, squirrels bagged per acre, proportion of gray and fox squirrels, condition of squirrels, sex ratios, and reproductive success. In all respects the 1952 season was better. The 1950 mast crop was poor, that of 1951 was good. Following cold, wet spring in 1951 there were many late litters, and a good population survived hunting. Author suggests that 1951 hunting (first in area in 12 years) may have resulted in a more vigorous population and more active breeding in 1952. The good 1951 mast crop, however, makes it impossible to be sure of the effect of hunting.

Prychodko, W. A LIVE TRAP FOR GROUND SQUIRRELS. Journal of Mammalogy 33(4): 497, illus. Nov. 1952.

Describes and figures a helical wire trap that is inserted in burrow entrances. It should be relatively cheap and easy to make.

Scheffer, Theo. H. SPRING INCIDENCE OF DAMAGE TO FOREST TREES BY CERTAIN MAMMALS. Murrelet 33(3): 38-41, illus. Sept.-Dec. 1952.

Puget Sound region. Squirrels (S. griseus) girdle conifers to eat cambium, thus killing tops. Squirrel numbers have been much reduced by hunting and live trapping. Mountain beavers (Aplodontia rufa) eat almost any green plant material and will prune seedling trees to a height of 10 feet or more. They will also bark saplings that are weighted to earth by snow. Other information on Aplodontia habits is given. Black bears, especially of recent years, tear off bark to eat cambium in the spring. Twenty-five percent of a fir stand may be so injured. As a result, the State of Washington has removed all protection from bears in the Olympic peninsula and tree farmers are hiring men to kill bears.

MAMMALS--SCIURIDS--Continued

Schubert, G. H. PONDEROSA PINE CONE CUTTING BY SQUIRRELS. Journal of Forestry 51(3): 202, illus. March 1953.
Many ponderosa pines had more than half their cones cut and destroyed by squirrels, chiefly Tamiasciurus, in Stanislaus Experimental Forest, California. Jeffrey pines were also affected, but near-by sugar pines suffered little. The author offers no appraisal of the actual effect of this seed eating, but concludes "that squirrels at times may be a major deterrent to regeneration." [See also Tevis, this issue of WR, p. 23.]

MAMMALS--BEAVER

Benson, Seth B. NOTES ON THE SEX RATIO AND BREEDING OF THE BEAVER IN MICHIGAN. University of Michigan, Occasional Papers of the Museum of Zoology no. 335. 1-6 p., graph. June 1936. 10¢.

Brohn, Allen. BUSY BEAVERS MAKE TRACKS. Missouri Conservationist 14(4): 1-3, 13, illus. April 1953.
History, distribution (see map on back cover), numbers, rate of increase, and economic status in Missouri. The state now has approximately 12,000 beavers in about 2,500 colonies. Rate of increase is close to 60% per year. Beavers do some harm, especially in areas having drainage works, but in general are considered a great asset. Commercial trapping will have to be started soon.

Denney, Richard N. A SUMMARY OF NORTH AMERICAN BEAVER MANAGEMENT, 1946-1948. Colorado Game and Fish Department, Current Report 28. vii + 58 p., illus. Aug. 1952.
The first part of this paper is based on survey of literature and questionnaire returns from states and provinces. Major headings are: life history and habitat trends, populations, ecological effects (includes damage and relationships with trout), farms and refuges, trapping seasons and limits, size and value of harvest, and law enforcement problems. The second part of the paper presents results of a live-trapping study in Colorado: fate of marked beavers, travels, sex ratio, weights, experimental transplanting by parachute. The paper should be a valuable source of many types of information on beavers, particularly because of the large amount of data from so many political units. 58 references.

McAbee, M. L. HOOSIER STATE HAS ITS OWN BEAVER VALLEY. Outdoor Indiana 20(1): 20-21, illus. Jan. 1953.
In 1920 Indiana had no beaver. Now it has commercial beaver trapping. Most beavers trapped 1951-52 were small or immature, their pelts selling for $7 to $10 each. Number 4 traps take the most beavers. Number 2 traps are inadequate and are torn apart.

Nash, John Blake. AN INVESTIGATION OF SOME PROBLEMS OF ECOLOGY OF THE BEAVER IN NORTHERN MANITOBA. Department of Mines and Natural Resources, Game and Fisheries Branch, Manitoba. 64 p. April 1951. [From Journal of Wildlife Management 17(2).]

Nasset, E. S. GASTRIC SECRETION IN THE BEAVER (CASTOR CANADENSIS). Journal of Mammalogy 34(2): 204-209, illus. May 1953.

Schorger, A. W. LARGE WISCONSIN BEAVER. Journal of Mammalogy 34(2): 260-261. May 1953.
Weights of 78.5, 80.5, and 87.0 pounds. Southwestern Wisconsin.

Reid, Kenneth A. EFFECTS OF BEAVER ON TROUT WATERS. Maryland Conservation 29(4): 21-23, illus. Winter 1952.
Presents evidence that beaver ruin trout fishing by warming, silting, and blocking streams with their dams. "Where valleys are narrow and stream gradients steep, damage will be least. Where valleys are broad, gradients slight and water already near the critical temperature from the outflow from natural ponds

MAMMALS--BEAVER--Continued

and swamps, the damage will be greatest. Unfortunately it is in the latter type of habitat that beaver thrive and multiply. The only general exception to the ill effects of beaver on trout is in the high country of the western mountains. Here, with the source of the streams in eternal snow, the water may be too cold and the beds too steep and shallow for optimum growth of trout. By warming and ponding the water, trout are often benefited since increased acidity and increase of trash fish are negligible factors here. But elsewhere beaver and trout do not mix well for long."

Rutherford, William H. EFFECTS OF A SUMMER FLASH FLOOD UPON A BEAVER POPULATION. Journal of Mammalogy 34(2): 261-262. May 1953.
Flood of the Cache la Poudre River, Colorado, eliminated dams and lodges and may have reduced the population.

MAMMALS--MUSKRAT AND NUTRIA

Ashbrook, Frank G. MUSKRAT--NUTRIA. Louisiana Conservationist 5(6): 16-17, illus. March 1953.
The Louisiana muskrat harvest dived from over 8 million in 1945 to about 1 million in 1952. Factors that may be responsible are: storms and droughts that increase salinity and make conditions less suitable for muskrats; epizootics; and heavy mite parasitism. Drought and disease are considered the main factors. There is evidence of a roughly 10-year cycle that varies in different parts of the U. S. Nutria are increasing rapidly, and the harvest is 78,000 skins. But the pelt price is only $1.50-$2.00, so trapping effort is not great. Low pelt price is attributed to high processing costs and resultant high retail price and buyer resistance.

Benton, Allen H. AN UNUSUAL CONCENTRATION OF ALBINO MUSKRATS. Journal of Mammalogy 34(2): 262. May 1953.
Cayuga Co., N. Y.

Dozier, Herbert L. MUSKRAT PRODUCTION AND MANAGEMENT. U. S. Fish and Wildlife Service, Circular 18. 1-42 p., illus. 1953. 20¢ from Superintendent of Documents.
This guide for marsh operators and others engaged in muskrat management and harvesting contains much useful information simply presented. Subjects treated and space alloted to them are: review of muskrat biology (10 pages); improvement of habitat, estimation of numbers, and maintenance of a balanced population (13 pages); trapping and pelt handling (10 pages); pen-rearing (2 pages); live-trapping, handling, tagging, sexing, and shipping living muskrats (3 pages); management recommendations (2 pages). Little if any material is new, but it is valuable to have it brought together for practical use.

Kimsey, Alden. NUTRIA. Oklahoma Game and Fish News 9(3): 10-11, illus. March 1953.
Review of habits and importance. Largely compiled, but based partly on local information. Present status in state is not discussed, and importation and release are encouraged rather than discouraged.

Mathiak, Harold A. EXPERIMENTAL LEVEL DITCHING FOR MUSKRAT MANAGEMENT. Wisconsin Conservation Department, Technical Wildlife Bulletin no. 5. 1-35 p., illus. 1953.
Level ditches are nondrainage ditches that provide open water in relatively dry marshes. Experiments at the Horicon Marsh proved that these ditches greatly increase production of muskrats and other wildlife and led to many suggestions for ditch design and operation. Spacing of 200 feet apart gave best ratio of muskrat yield to cost, with costs being repaid in about 4 years. Dredging was much better and cheaper than blasting. Spoil banks were valuable for muskrat burrowing and waterfowl nesting. The paper gives data on these subjects and also on muskrat populations and movements.

MAMMALS--MUSKRAT AND NUTRIA--Continued

Thomas, Earl M. THE FUR-BEARING MAMMALS OF WYOMING. Wyoming Wild Life 17(4): 4-9, 27, illus. April 1953.
Fourteenth installment. Reviews habits, biology, and economic importance of muskrat. Muskrats should be given legal status as fur-bearers in Wyoming, where they now have no protection.

MAMMALS--FURBEARERS--GENERAL

Anonymous. OKLAHOMA FUR HARVEST DOWN 70 PER CENT. Oklahoma Game and Fish News 9(5): 8. May 1953.
Numbers of mink, opossum, muskrat, skunk, and raccoon skins marketed in Oklahoma and prices paid, 1951-52 and 1952-53 seasons. Season was closed on mink in 1952-53 season owing to drought, but even aside from this the fur harvest was lower than in previous year and pelt prices were down.

MAMMALS--BEARS

Anderson, Roy C. DESCRIPTION AND RELATIONSHIPS OF DIROFILARIA URSI YAMAGUTI, 1941, AND A REVIEW OF THE GENUS DIROFILARIA RAILLIET AND HENRY, 1911. Transactions of the Royal Canadian Institute 29(2): 35-65, illus. 1952.
Subcutaneous nematodes collected from black bears (Ursus a. americanus) from Ontario are referred to Dirofilaria ursi Yamaguti, 1941 (type host: Ursus torquatus japonicus from Japan). The males and microfilariae are described for the first time and the females are redescribed. This species is compared with closely related species, especially D. subdermata (syn. D. spinosa) from the porcupine. The genus Dirofiliaria is reviewed. It is worth pointing out that Choquette in a paper published almost simultaneous with mine ("Dirofilaria desportesi sp. nov., a filariid from the black bear in Canada." Can. J. Zool. 30: 344-51. 1952.) regards the North American worms from bears as a new species although he admits that no systematic differences can be found between his material and that described from Japan.--Roy C. Anderson.

Richards, E. V. VIRGINIA'S BLACK BEAR--GOOD OR BAD? Virginia Wildlife 14(2): 16-17, 21, 23, illus. Feb. 1953.
There are about 700 bears in Virginia, most of them in national forests of the western part, some in the Dismal Swamp. Annual kill (given by counties, 1946-51) now varies from 62 to 310. The state encourages bears on national forests, but stock killers must be controlled. All stock killers have been males, often in poor condition. Several counties require big game hunters to buy $1 bear-deer damage stamps. Hunting is best in years of good food conditions. When food is scarce, bears tend to move out of the mountains. Methods of hunting bears, and habits of bears, are described in a general way.

MAMMALS--RACCOON AND RINGTAIL

Costa, Robert Richard. FOOD HABITS OF THE RACCOON PROCYON LOTOR HIRTUS N. AND G., IN CENTRAL IOWA. M. S. thesis, Iowa State College. 1951.

McLaughlin, John H. FACTORS INFLUENCING THE RACCOON AND ITS MANAGEMENT IN SOUTHWESTERN VIRGINIA. M. S. thesis, Virginia Polytechnic Institute. 33 p. 1953.

Whitney, Leon F., and Acil B. Underwood. THE COON HUNTER'S HANDBOOK. Henry Holt & Co., N. Y. 17, N. Y. 210 p., illus. 1952. $3.00.
Easily read and jammed with practical, interesting information, this book should serve its purpose excellently. The authors, one a raccoon breeder, one a veterinarian as well as a breeder and trainer of coonhounds, and both avid coon hunters, tell virtually everything a coon hunter would want to know. There is, of course, much about raccoon habits and biology. Principles and practice of coon hunting are well expounded, with interesting anecdotes. Coon dogs are discussed in chapters on qualifications, breeds, the still trailer, how to obtain a coon dog, and training. Other chapters take up coon-hunting equipment, care

MAMMALS--RACCOON AND RINGTAIL--Continued

and use of pelt and carcass, and the operation of field trials. Sound, pointed advice based on much experience is evident on every page. A useful index is included and the book is attractively illustrated with pen and ink sketches.--L. M. Llewellyn.

Wilson, Kenneth A. RACCOON PREDATION ON MUSKRATS NEAR CURRITUCK, NORTH CAROLINA. Journal of Wildlife Management 17(2): 113-119, illus. April 1953.
Evidence of several types is given that raccoons have lowered muskrat populations substantially by tearing open houses and eating young.

MAMMALS--MUSTELIDS

Anonymous. CONTROL OF SKUNKS. U. S. Fish & Wildlife Service, Wildlife Leaflet 181. 2 p. Revised 1952.

Bowman, Nathaniel Robert. THE RELATION OF THE SKUNK TO GAME AND BURROW-USING ANIMALS IN VIRGINIA. M. S. thesis, Virginia Polytechnic Institute. 41 p. 1953.

Cochran, Rod. HE ALWAYS WALKS TO THE NEAREST EXIT. Ohio Conservation Bulletin 17(5): 2-3, illus. May 1953.
This popular article states that only 4,537 skunks were reported for the 1951-52 trapping season in Ohio. This represents a decline to less than 3% of the 1939-40 harvest. South of the Lake Erie area, populations have decreased seriously. The cause is thought to be "a virus infection that produces symptoms similar to distemper and which particularly affects the kits."

Franey, Edward M. ARE THERE WOLVERINES IN MINNESOTA? Conservation Volunteer 16(91): 18-20. Jan.-Feb. 1953.
Uncertain records for 1934 and 1947 discussed.

Gorham, J. R., and H. J. Griffiths. DISEASES AND PARASITES OF MINKS. U. S. Department of Agriculture, Farmer's Bulletin no. 2050. 1-41 p., illus. Nov. 1952. 15¢ from Superintendent of Documents.
Primarily for mink ranchers. Discusses many diseases and parasites, with information on causes, symptoms, prevention, and treatment. Sanitation in the mink ranch is also discussed.

Liers, Emil E. AN OTTER'S STORY. Viking Press, N. Y. 1-191 p., illus. April 1953. $2.50.
Probably no one is better qualified to write a popular book on the habits and behavior of otters than is Emil Liers, who has worked with and studied them for many years. The story is a fictionalized account of a family of otters in Wisconsin and Northern Michigan, but "Each incident is based on actual facts and really happened at one time or another to otters I have known." The story is interesting throughout although it follows the lives of the otters without depending on human affairs more than incidentally. It is slightly but not objectionally anthropomorphic and should interest readers of all ages. Almost anyone could learn a great deal from it about otter traits and biology. Wildlife managers may be impressed with the difficulty of managing such wide-ranging animals, and with the fact that the chief encouragement otters seem to need is greater protection from trapping. The species is common in but few parts of the U. S. and, as one of our most valuable and attractive animals, certainly deserves more management attention than it has received.

Newby, Fletcher E. MONTANA'S WILDERNESS WANDERERS. Montana Wildlife 3(1): 14-15, illus. Winter [March] 1953.
Present distribution and status of wolverine in state. Though unprotected, wolverines began to come back from near extermination in the 1930's. Recovery is attributed to restricted trapping seasons. Since 1944 there have been 20 sight records, and since 1940 there have been 14 shot or trapped. These records are mapped. Notes on life history are given. A 1952 pelt sold for $20.

MAMMALS--MUSTELIDS--Continued

Scheffer, Victor B. OTTERS DIVING TO A DEPTH OF SIXTY FEET. Journal of Mammalogy 34(2): 255. May 1953.
Found drowned in crab or lobster pots.

Thomas, Earl M. THE FUR-BEARING MAMMALS OF WYOMING. Wyoming Wild Life 17(1): 28-32, illus. Jan. 1953.
Eleventh installment, review of habits of badgers. The badger is listed as a predator in Wyoming. Its populations are rather large in many of the arid, more sparsely settled parts of the state.

Van Gelder, Richard G. THE EGG-OPENING TECHNIQUE OF A SPOTTED SKUNK. Journal of Mammalogy 34(2): 255-256. May 1953.
Egg was kicked backward until it struck a hard object and broke.

Wilson, Kenneth A. THE ROLE OF MINK AND OTTER AS MUSKRAT PREDATORS IN NORTHEASTERN NORTH CAROLINA. Presented at 6th Annual Conference, Southeastern Association of Game and Fish Commissioners, Oct. 19-22, 1952, Savannah, Georgia. 1-9 p., graphs. [Available from J. H. Jenkins, U. of Ga., Athens.]
Food habits of mink and otter taken during 4 trapping seasons (1947-51) in Currituck County, N. C. Digestive tracts of 568 minks and 54 otters and a number of scats were examined. The important foods of mink were fish (61% by frequency), rats and mice (34%), arthropods (30%), birds (18%), frogs (13%), and snakes (5%). Muskrats appear to be a minor fall and winter food of minks in the area. Perhaps less than 10% of the fish were game or pan species. For the otter, fish (mostly non-game) occurred in more than 90% of the samples, birds in 3%. Arthropods made up most of the balance. Muskrat occurred only once. The author reaffirms his belief that litter-eating raccoons are responsible for the local drop in muskrat production.--L. M. Llewellyn.

MAMMALS--DOGS, WOLVES, FOXES

Burns, Marca. THE GENETICS OF THE DOG. Commonwealth Agricultural Bureaux, Farnham Royal, Bucks, Eng. 122 p., illus. 1952. 12 s. 6 d. [From review by L. F. Whitney, Science 117(3038).]
"Marca Burns is a geneticist as well as a dog breeder, and this little book amply proves the connection. It contains a digest of the world's technical studies of dog genetics, yet is written for the layman with a background of college biology...a helpful, useful book to every scientist interest in canine genetics and every layman interested in dog breeding." Bibliography of 240 items.

Keefe, Jim. AN OUTCAST IN GREY. Missouri Conservationist 14(2): 6-7, 14-15, illus. Feb. 1953.
A general review of coyote habits leads into a discussion of the new Missouri bounty system. The new state-county payment is $30 per adult, $5 per pup. The author gives reasons for doubting that this bounty will have the desired effect, and suggests the money would be better spent hiring local trappers who could concentrate on individual coyotes actually doing damage. These trappers could also put down local fox damage. The state already has a system of extension trappers who teach farmers to control bothersome predators.

Thomas, Earl M. THE FUR-BEARING MAMMALS OF WYOMING. Wyoming Wild Life 17(2): 28-31, illus. Feb. 1953.
Twelfth installment, review of gray fox habits. No information on status or biology in Wyoming.

Thomas, Earl M. THE FUR-BEARING MAMMALS OF WYOMING. Wyoming Wild Life 17(3): 10-15, illus. March 1953.
Thirteenth installment. Review of habits of red and kit foxes.

MAMMALS--CATS

Meschkat, Ray S. THE MOUNTAIN LION IN TEXAS. Texas Game and Fish 11(3): 24-26, illus. Feb. 1953.
Brief account of occurrence, habits, and economics. The puma is growing scarcer because of predator control efforts, but still occurs regularly in South and West Texas. Public sentiment would not permit placing it on the game list, but this may be necessary in the future to prevent extinction in the state. One state (Florida) has already declared the puma a game animal.

MAMMALS--BIG GAME--GENERAL

Anonymous. THE 1952 HUNTER HARVEST. Wyoming Wild Life 17(2): 4-16, illus. Feb. 1953.
Big game, Wyoming. Hunting statistics of various sorts are presented in tables interspersed with paragraphs on the natural history and status of big game species. Total kill was: antelope, 41,020; deer, 40,433 (3,546 of them whitetails); elk, 7,816; moose, 437; black bear, 335; grizzly bear, 6; mountain sheep, 58. Kill of moose and mountain sheep is restricted by special permit system. Hunting success for antelope was about 95%; for other species it was about 46%.

Colls, D. G. SURVEYS OF ELK AND OTHER WILDLIFE IN RIDING MOUNTAIN NATIONAL PARK, MANITOBA, 1950-1951, AND 1952. Canadian Wildlife Service, Wildlife Management Bulletin Series 1, no. 6. 1-25 + 6, illus. 1952.
Elk populations as determined from aerial surveys; range utilization and elk condition; conflicts of elk with agriculture; notes on deer, moose, coyotes, and wolves. Elk numbers are relatively static. Deer are increasing. Moose appeared to be much commoner in 1952 than in 1951. Despite some control in and around the park, the park has about 25 wolves and several hundred coyotes. Elk remains were found in both wolves and coyotes, but these carnivores are not considered a menace to other wildlife populations in the park. Groups of elk showed no fear of near-by coyotes.

Crane, Harold S., Dale A. Jones, and Wallace Jensen. UTAH BIG GAME HARVEST 1952. Utah Department of Fish and Game, Departmental Information Bulletin no. 6 of the Federal Aid Division. 1-61 p., illus. April 1953.
An exceptionally detailed report. The Department of Fish and Game divides Utah into 62 deer management units; the department has--and increasingly uses--much latitude in varying hunting in different units to achieve herd control. Some of the elk hunts are arranged when and where crop damage is occurring. The whole big game system seems highly flexible, adaptable to diverse needs. The present report explains these points, tells how kill data are gathered and computed, and gives many data on: deer hunting statistics, 1939-52; results of regular and special deer hunts in 1952; kill of deer by day of season; hunting pressure per management unit; elk hunting statistics 1931-52, especially in 1952. In 1952, 115,887 hunters bagged 52,655 bucks and 26,296 does for hunter success of 68% in the regular season. Special hunts resulted in kill of 3,952 bucks and 7,258 does. Elk hunters had 76% success in killing 641 bulls and 682 cows. About 58% of the deer kill occurs in the first 2 days of the season.

Hatter, J. SOME TRENDS IN THE HUNTING AND HARVEST OF MOOSE AND MULE DEER IN BRITISH COLUMBIA. Report of Proceedings, 6th Annual Game Convention, Vernon, B. C., May 7-10, 1952. British Columbia Game Department, Victoria, B. C. 57-63 p. 1952.

Murie, Olaus J. PLANNING FOR ALASKA'S BIG GAME. Science in Alaska, Special Publ. Arctic Inst. North Amer. (Washington) no. 1. 258-267 p. June 1952. [From Journal of Mammalogy 34(2).]

MAMMALS--BIG GAME--GENERAL--Continued

RECORDS OF NORTH AMERICAN BIG GAME. Compiled and edited by the Committee on Records of North American Big Game of the Boone and Crockett Club. Charles Scribner's Sons, N. Y. and London. xiii + 174 p., illus. 1952. $6.00. [From review in Outdoors News Bulletin 7(3).]

The new scoring system is fully explained. Record heads and many other exceptional trophies are illustrated. This book is the standard reference on its subject.

MAMMALS--HOOFED (Except deer)

Anonymous. CALIFORNIA'S TULE ELK. National Parks Magazine 27(112): 33-34, illus. Jan.-Mar. 1953.

History and status of the transplanted herd formerly at Yosemite and now in Owens Valley, Inyo County. This herd is now estimated at 200 head. It is suggested that these dwarf elk should be given the southern end of the valley free from competition with livestock. The area is owned and operated by the City of Los Angeles, which leases grazing rights.

Brazda, Arthur R. ELK MIGRATION PATTERNS, AND SOME OF THE FACTORS AFFECTING MOVEMENTS IN THE GALLATIN RIVER DRAINAGE, MONTANA. Journal of Wildlife Management 17(1): 9-23, illus. Jan. 1953.

Seasonal movements of color-banded elk are described. Sturdy plastic ear tags were successful. Abundance of tabanids in an area appeared to be inverse to numbers of elk, suggesting that elk move away from biting fly concentrations. Stage of development of food plants (listed) did not seem correlated with elk travels.

Coffin, A. Lynn, and Jack D. Remington. PREGNANT YEARLING COW ELK. Journal of Wildlife Management 17(2): 223. April 1953.

Rocky Mountain National Park, Jan. 1952. Age of yearling was about 20 months. Six other yearlings were not gravid.

Couey, Faye. ARE THE BIGHORNS DOOMED? Montana Wildlife 3(1): 16-18, illus. Winter [March] 1953.

Montana bighorns were reduced to about 12 bands but are slowly increasing. There are about 1,600 in 15 areas of the state. Locations of major herds are mentioned and transplanting projects are discussed. Elimination of competition with elk in winter has helped one herd.

Daniels, T. W. "Bill". WINTER AT BLACKROCK...A BIG GAME REPORT FROM A SNOWBOUND WILDERNESS. Wyoming Wild Life 17(2): 20-27, illus. Feb. 1953.

Observations made while operating a big game feeding station in northwestern Wyoming for 10 years. Topics include: natural winter foods of elk; starving elk; adequacy of hay as elk emergency food; behavior of moose at feeding station (amazingly tame); subordination of moose to elk at feeding station; inability of orphan moose calves to survive winter at feeding station; moose ticks (abundant every third spring, apparently host-specific, lethal to weak moose); recovery of moose and elk from severe wounds. The author maintains that elk survive reasonably well when fed hay, and that small-scale winter feeding makes it possible to carry over good, huntable populations where otherwise there would be few animals.

Edwards, R. Y. AN AERIAL MOOSE CENSUS. British Columbia Forest Service (Victoria), Research Notes no. 23. 9 p., map. 1952. [From Journal of Forestry 51(2).]

Fisher, Ralph A., Sr. HUNTING ARIZONA JAVELINA. Arizona Wildlife-Sportsman 24(2). 16 unnumbered p. following p. 28. Illus. Feb. 1953.

Though primarily on hunting and handling of meat, this article contains information on habits, habitat, and conservation. About 12,000 javelina permits are now sold annually in Arizona and hunter success is approximately 24%. Increased hunting pressure may be reducing the population, breaking up the larger herds, and driving them into areas where they are harder to hunt.

MAMMALS--HOOFED (Except deer)--Continued

Hanson, Herbert C. IMPORTANCE AND DEVELOPMENT OF THE REINDEER INDUSTRY IN ALASKA. Journal of Range Management 5(4): 243-251, illus. July 1952.
History and value of the industry, population trends and their significance, sources of difficulties, reasons for population crash, status of lichen range, future of the industry, administrative and research needs. The crash is attributed in part to economic problems and mismanagement, and in part to overexploitation of the lichen ranges and to disregard of scientific advice. There is great need of reindeer meat in Alaska, but gradual re-expansion of herds should be preceded by range research (topics here itemized) and accompanied by far more thorough education and administration. The author says little about caribou except to state that reindeer herds should be located where there is freedom from invasions by caribou.

Jellison, William L., Charles W. Fishel, and E. L. Cheatum. BRUCELLOSIS IN A MOOSE, ALCES AMERICANUS. Journal of Wildlife Management 17(2): 217-218. April 1953.
Montana, 1951.

Kittams, Walter H. REPRODUCTION OF YELLOWSTONE ELK. Journal of Wildlife Management 17(2): 177-184. April 1953.
Study of slaughtered females from a herd that has greatly exceeded the capacity of its late winter range. Breeding was common in 2-year-olds, rare in yearlings, absent in calves. Pregnancy rate was 85% for elk over 2 years of age. One young was the rule, with twins rare. Sex ratio of fetuses was nearly 1:1.

Kohls, Glen M., and M. J. Kramis. TICK PARALYSIS IN THE AMERICAN BUFFALO, BISON BISON (LINN.). Northwest Science 26(2): 61-64, illus. June 1952. [From Journal of Mammalogy 34(2).]

Locker, Betty. PARASITES OF BISON IN NORTHWESTERN U. S. A. Journal of Parasitology 39(1): 58-59. Feb. 1953.

Mabery, Chuck. LO, THE BIGHORN. Arizona Wildlife-Sportsman 24(3): 24-35, illus. March 1953.
Arizona authorized the shooting of 20 desert bighorn rams. During the period Jan. 9-18, 1953, twenty hunters managed to get only 10 rams, although fair numbers of sheep were seen. This well illustrated article tells about the hunt and bighorn habitat and gives some information on habits.

McMillan, John F. SOME FEEDING HABITS OF MOOSE IN YELLOWSTONE PARK. Ecology 34(1): 102-110. Jan. 1953.
Foods, feeding behavior, effect on plants. Roughly 88% of the food is willow browse, 9% aquatic plants, the rest forbs and sedges. Mineral licks are regularly used for their chlorides and sulfates of sodium and calcium. In feeding on willows, moose move about 3 yards in 5 minutes, nipping and stripping tender browse as they go. Feeding is done from underwater to heights of 7 feet, and even higher in winter, but 56% of browsing is done at heights of 2-4 feet. Browsing at center and edge of willow copse is about equal.

McMillan, John F. MEASURES OF ASSOCIATION BETWEEN MOOSE AND ELK ON FEEDING GROUNDS. Journal of Wildlife Management 17(2): 162-166. April 1953.
As an approach to study of moose-elk competition in Yellowstone Park, mathematical analysis was made of the frequency with which both species appeared in the same plots. Three types of analysis were applied. "It appears to be evident that elk are using the moose range more heavily, resulting in damage which may seriously affect the Yellowstone moose population."

Miner, Eugene D. ELK TRAPPING IN UTAH. Utah Fish and Game Bulletin 9(5): 7-8, illus. May-June 1952.
Describes semipermanent and portable traps. Trapping has been used successfully to reduce crop damage in winter.

MAMMALS--HOOFED (Except deer)—Continued

Mishin, I. P. WILD REINDEER OF SAKHALIN (Dikiy severnyy olen' Sakhalina). Priroda [Nature] (Moscow) no. 1. p. 120. 1952. [From Polar Record 6(45).]
"Movements of wild reindeer in Sakhalin."

Muchmore, Pete. ELK MIGRATION...A COMPLICATING FACTOR IN JACKSON HOLE. Wyoming Wild Life 17(1): 14-16, 27, illus. Jan. 1953.
Discusses migrations, hunts, and harvests, 1949-52. The resident herd gradually is being overshot, but it is difficult to get adequate harvest of the migratory herd without creating firing-line conditions. Possible solutions would be to establish strategically located closed areas, or to open areas to the hunting of mature bulls only.

Murie, Olaus J. TETON'S ELK PROBLEM CONTINUES. National Parks Magazine 27(113): 56-57. April-June 1953.
Current status of the controversy from the Park Service point of view.

Smith, Dwight R. IDAHO BIGHORN SHEEP STUDIED. Idaho Wildlife Review 5(5): 4-7, 10, illus. March-April 1953.
Research report on history in state, present populations, cause of losses, mineral preferences, productivity, and management recommendations. The herd was at its lowest about 1930, is slowly increasing, and now numbers about 2,500. Losses to predators seem light, with puma probably chief predator. Winter food is about 70% grass and weeds, which lessens competition with deer and elk. In tests with 10 minerals, sodium iodide was preferred; iodized salt has been distributed experimentally. There are about 2 ewes per lamb. Survival of lambs to yearlings is 40%; most lamb loss is in winter and cause is unknown. Thirteen rams were killed on 45 permits in 1952. Recommendations include: control of predators, competitors, and poaching where needed; continuation of censuses; limited harvests; consideration of transplanting.

MAMMALS--DEER

Anonymous. WINTER DEER LOSSES GREATEST IN UTAH'S HISTORY. Utah Fish and Game Bulletin 9(5): 1-2, illus. May-June 1952.
The winter of 1951-52 was one of the longest and hardest in history and had the greatest recorded precipitation. An estimated 20,450 deer died. There was even considerable winter kill of elk. Largest deer losses occurred where agriculture and community construction had taken over game lands. Supplemental foods valued at $33,580 were fed to keep deer from damaging crops and wandering into communities. Some of the herds will have to be heavily harvested by special hunts.

Anonymous. MONTHLY SUMMARY OF DEER LOSSES FROM PROTECTOR'S REPORTS 1952. State of Washington Department of Game. 12 unnumbered p., mimeo. 1953.
Tables show: causes of losses, frequency of various losses by county, frequency by months, and numbers of young carried by adult does in spring. Other tables summarize elk losses by month, cause, sex and age groups.

Anonymous. WHAT'S YOUR DEER HERD WORTH TO YOU? New Jersey Outdoors 3(7): 4-5, illus. Jan. 1953.
History of New Jersey deer and their restoration. Nearly exterminated by 1900, 4,547 were taken legally in 1951. The problem now is practical management and control.

Anonymous. 1952 TENNESSEE DEER HUNTS HIGHLY SUCCESSFUL. Tennessee Conservationist 18(2): 14, illus. Feb. 1953.
Three counties were open, and special hunts were held on 5 management areas. Total kill for the state was 522. Average live weight was 137 pounds. Table shows kill, average weight, and hunter success in each area.

Barron, William Darlington. USE OF SALT IN MANAGING MULE DEER AND DOMESTIC ANIMALS ON RANGE LANDS OF CENTRAL OREGON. Master's thesis, Oregon State College, 1953.

MAMMALS--DEER--Continued

Buxton, Frank Edwin. FOOD HABITS OF THE WHITE-TAILED DEER, ODOCOILEUS VIRGINIANUS BODDAERT, IN BOONE COUNTY, IOWA. M. S. thesis, Iowa State College. 1951.

Cheatum, E. L. ADIRONDACK DEER: A NEW PROPOSAL FOR THEIR MANAGEMENT IN WILDERNESS AREAS. New York State Conservationist 7(5): 5, map. April-May 1953.
The Adirondacks have many areas of low hunting pressure and starvation. Desired sex ratio for optimal growth and reproduction is 1 buck to 2 does. It is proposed to issue special antlerless deer licenses, each for a given tract, in sufficient numbers to reduce populations adequately. A hunter could bag one deer on his regular license, another on his special license. There would be no limit on the number of regular licensees who could hunt in areas in question, but they could shoot only antlered deer.

Cottam, Clarence, and Philip A. Dumont. WHAT HAS HAPPENED TO THE KEY DEER? National Parks Magazine 27(113): 82. April-June 1953.
The herd has increased from perhaps 24 to about 70. Protection and study are being given temporarily. Favored food is abundant, but all-season water developments would help. Fires and destruction by dog packs have been controlled. The present small range probably can support 300 deer, but this range could be expanded. Authority to purchase refuge lands has not been given by Congress. A leasing approach may be more likely of success.

Crane, Harold S., and Dale A. Jones. INITIAL PROOF OF MULE DEER FAWNS BREEDING IS FOUND IN UTAH. Journal of Wildlife Management 17(2): 225. April 1953.
Occurred on game farm where supplemental feed (grain and salt) was always available. The first young was born when mother was about 2 years old.

DeBoer, Stanley G. --AND THE BROWSE CAME BACK. Wisconsin Conservation Bulletin 18(1): 3-10, illus. Jan. 1953.
Photographic evidence that recent reductions in Central Wisconsin's deer herd have permitted good regeneration of several browse species. Also reminder that if browse pressure is kept light too long, much of the new growth will grow up out of reach.

DeGarmo, W. R. RESULTS OF THE SECOND 'ANY DEER' SEASON. West Virginia Conservation 16(12): 34-37, illus. Feb. 1952.
Discusses 1952 West Virginia deer kill and gives table of kill by counties and per square mile. Total reported kill was 17,140 as compared with 21,951 in 1951 when weather was far more favorable for hunting. State-wide kill per square mile was 1.12, and sex ratio was 52% does, 48% bucks. It is believed that the state can support an annual kill of 20,000 to 25,000. Author recommends seasons longer than 3 days, with same length of season to apply to whole state, and with certain counties closed as need be.

Gilfillan, Merrill C. OPERATION DEER PASTURE. Ohio Conservation Bulletin 15(12): 8-9, illus. Dec. 1951.
State forests in Southern Ohio are growing too tall and dense to provide much deer food. Clear-cutting of 5 to 10-acre patches is being done. Each patch should be useful to deer for 6 or 7 years. The plan is to have at least 5% of each forest thus clear-cut, and to have a clear-cut area cover at least 5% of the home range of each deer.

Hagen, Herbert L. NUTRITIVE VALUE FOR DEER OF SOME FORAGE PLANTS IN THE SIERRA NEVADA. California Fish and Game 39(2): 163-175. April 1953.
Results of chemical analyses and feeding trials and their relation to conditions in the wild. Forage species preferred by deer are high in protein; other characteristics are of secondary importance. Protein content of plants is high in summer, low in late winter when deer starve. Plants of summer range are highest in protein in spring, thus providing fine food when deer arrive. Nutritive value of winter range plants goes down during winter because best parts are eaten first, and because nutritive content is decreasing. Digestion

MAMMALS--DEER--Continued

of buck brush by deer was as efficient as digestion of good hay by cattle, except that assimilation of protein by deer was low. This weakness may aggravate winter food problems.

Harlan, James R. THE IOWA DEER PROBLEM AND ITS SOLUTION. Iowa Conservationist 12(1): 97, 102, illus. Jan. 1953.
This and other articles in the same issue summarize knowledge of Iowa's deer. There were only a few hundred deer in the state in 1936 but now there are about 10,000. Deer are known to occur in all but 3 counties. They are causing many highway accidents and much crop damage. Bills to permit controlled harvesting have been introduced. Maps show Iowa winter deer range, 1951, and numbers of deer killed by cars, 1951-52.

Haugen, Arnold O. AMMATE IN THE DIET OF DEER. Journal of Wildlife Management 17(1): 33-36. Jan. 1953.
Author's summary: "Deer that were provided Ammate in crystalline form or were fed Ammate-treated foliage of sweet gum, post oak, water oak, persimmon, and black cherry were found to suffer no ill effects from the diet. Results indicate that the use of Ammate in weeding out trees does not endanger deer."

Hayne, Don W., and Lee Eberhardt. NOTES ON THE ESTIMATION OF SURVIVAL RATES FROM AGE DISTRIBUTIONS OF DEER. Presented at 14th Midwest Wildlife Conference, Des Moines, Iowa, Dec. 17-19, 1952. 1-6 p. + 5 graphs. 1952.
Age distributions that are being worked out for many deer herds often can be used to estimate survival rates. Ricker, working with estimates of fish populations, developed a method of plotting catch on a semilogarithmic scale. Kill curves of deer, like catch curves of fish, often contain a decending constant slope that represents equal vulnerability of mature animals and decreasing numbers with passage of time. Within certain limitations relating to herd and hunting stability, the constant slope of a kill curve can be interpreted in terms of survival for each age class. Included in five simple charts is one that dramatically points up the value of plotting age distributions logarithmically.--John T. Linehan.

Kerns, Chester M. DEER KILL IN MARYLAND--1952. Maryland Conservationist 30(1): 8-9, illus. Spring 1953.
Includes tables showing deer harvest (by counties) 1949-52, and weights (by counties) 1952. Twelve counties were open in 1952. Total legal kill was 1,575.

Krefting, Laurits W. DEER DAMAGE TO A JACK PINE PLANTATION IN MICHIGAN. U. S. Forest Service, Lake States Forest Experiment Station (St. Paul 1, Minn.), Technical Notes no. 387. 1 p. Jan. 1953.
Exclosure study shows "that the protected seedlings suffered no mortality and the total height of all trees increased from 128 to 178 percent in two years. The unprotected seedlings suffered from 23 to 31 percent in mortality and had a lower height growth. In fact the total height of all the natural seedlings had 28 percent less growth in 1951 than in 1949. All mortality and height reduction was attributable to deer browsing. These data illustrate the need for deer herd control if satisfactory jack pine regeneration is desired."

Latham, Roger M. TOO MANY, TOO LONG! Pennsylvania Game News 24(2): 4-7, illus. Feb. 1953.
Breaking the news bluntly to Pennsylvania's deer hunters. The state had too many deer too long and the range is ruined. It will take a long time for the range to come back. Food plants usually are consumed well before the emergency period of mid-winter arrives, and artificial measures are little help. Range destruction has also caused loss of grouse, cottontail, and snowshoe hare hunting. Thousands of acres of over-browsed range have gone into bracken and grass. "The Cameron County elk herd is on the increase, and it may suggest a substitute for the deer on these open areas. Even the sharp-tailed grouse, a bird of semi-open grasslands, is being considered for importation and trial as a temporary substitute for the ruffed grouse."

MAMMALS--DEER--Continued

Linsdale, Jean M., and P. Quentin Tomich. A HERD OF MULE DEER. University of California Press. xiii + 567 p., illus. 1953. $8.50.

Thirteen years of detailed observation of deer of the Hastings Reservation, California, produced much information of types seldom available from management or experimental behavior studies. The report on this work unquestionably is an important contribution to knowledge of deer habits and behavior. Where else can one find just how deer react to individual predators, to fences, to minor changes in weather, and to dozens of other factors in their environment? Virtually every aspect of field biology of the herd is described, and many special topics such as antler development and reproductive cycle are analyzed. Chapter titles are: Introduction, Structure, Communication, Mannerisms, Relation to other animals [including parasites], Habitat, Activity, Food, Reproduction, and Population. A substantial part of the presentation is narration of single observations, and many apparently minor details are included. This permits an objective account of individual variations, but makes the report bulky and the conclusions difficult to grasp. The reader must do his own screening, for there is no section of summary or conclusions. Index and table of contents, however, are detailed. The list of literature cited includes only 32 titles.

Longhurst, William M. PLANTING TO REDUCE DEER DAMAGE. California Agriculture 7(2): 4, illus. Feb. 1953.

Reports quantitatively the deer use in Mendocino Co., California of plots of common Sudan grass, sweet Sudan, Sudan 23, oats, and oat-vetch mixture. Use was determined partly by number of deer pellet groups in plots (figured at 12.7 groups per deer day). Use of oats and oat-vetch mixture was heaviest in midwinter and spring. As oats matured, deer switched to vetch. Use of sweet Sudan was nearly 16 times that of Sudan 23, with use of common Sudan intermediate. "Sudan 23 is known to be less palatable for livestock than Sweet Sudan but it produces up to 25% more feed than other strains. This together with its low palatability for deer make it a good choice."

Longwell, J. R., V. F. Flyger, and R. D. Vandeusen. WHITE-TAILED DEER STUDY. THREE YEAR PROGRESS REPORT (1949, 1950 AND 1951 SEASONS). Maryland Board of Natural Resources, Department of Research and Education (Solomons Island, Md.), Resource Study Report no. 1. 1-9 p., illus. Oct. 1952.

Report of checking station studies of weights, antler beam diameters, hind foot lengths, and age composition of herds of various parts of the state. Total kill in state rose from 311 in 1941 to 1182 in 1951. "The composition by age classes shows a progressive increase in the number of 1½ year old deer and a corresponding decrease in the older age classes. The overall indications are that Maryland deer are becoming slightly smaller in size and slightly lighter in weight, probably due to increased numbers of deer, and hence increased competition for food." Liberalization of regulations to permit shooting deer with any size of antler is recommended.

Mace, Robert U. OREGON'S MULE DEER RESOURCES (Cover title: Oregon's Mule Deer). Oregon State Game Commission, Portland 8, Ore. 1-26 p., illus. No date. [1953.]

A semitechnical information pamphlet that tells nearly everything the public might wish to know about the subject. Need of proper herd management is stressed. Other subjects are: description and characteristics, food habits, history in state, distribution and habitat in state, studies being made, past and present management, hunting, care of carcass and meat.

Martin, F. R., and L. W. Krefting. THE NECEDAH REFUGE DEER IRRUPTION. Journal of Wildlife Management 17(2): 166-176, graph. April 1953.

Deer of this central Wisconsin area increased from 6 per square mile in 1936 to 80 per square mile in 1946. Hunting from 1945 through 1950 reduced the herd to a level the range could support. Had hunting begun earlier, far more deer could have been taken and the range would not have been reduced in carrying capacity. Deer weights on the refuge were lower than on good range in the region. Fawn production doubled in one year when many deer were shot. Tables show numbers of deer killed, winter browse condition (by species), and dressed weights.

MAMMALS--DEER--Continued

Petrides, George A. AERIAL DEER COUNTS. Journal of Wildlife Management 17(1): 97-98. Jan. 1953.
Aerial counts may be of value (at least in determining trends) even in wooded country, for deer come into openings at sundown. Counts are fairly consistent and age ratio can be determined.

Robb, Dunbar. DIXIE'S DOPE ON DECEMBER'S DEER. Missouri Conservationist 14(3): 1-3, 12, illus. March 1953.
Report on Missouri's 1952 deer season. About 37,600 hunters bagged 7,500 whitetails, a new high both in total kill and hunter success. The kill represented 1 deer per 3½ square miles. Deer bagged in any-deer counties were 45% bucks and 55% does just as in 1951. Animals shot were 37% fawns, 24% yearlings, and 39% adults, much as in 1951. It is concluded that any-deer shooting has not hurt the herds but has permitted harvest of 8,000 more deer. Local variations in harvest and weights are described. Studies of reproductive tracts revealed that 26% of fawns were breeding, and that maximum potential crop was 173 fawns per 100 breeding does. Causes and cures of hunting accidents are analyzed with the conclusion that changes in clothing, arms, and regulations would do little good.

Rogers, John R. REPORT OF THE DEER HERDS IN DISTRICT #5. State of Washington Department of Game. 1-13 p., mimeo. March 1953.
Range conditions, estimated kill, sex ratios (1950-53), types and amounts of deer losses to causes other than hunting, movements of trapped and tagged deer. Deer that apparently were released where trapped travelled 4-20 miles, with average of 7 miles for 13 does.

Severinghaus, C. W. SPRINGTIME IN NEW YORK--ANOTHER ANGLE. New York State Conservationist 7(5): 2-4, illus. April-May 1953.
Why and how deer select and use wintering yards, and why yards are often death traps. Most yards are selected because they provide shelter from wind, least depth of snow, and sunning places. Food is not a factor in selection of yards, and in bad winters deer will not leave yards to seek food.

Smith, Arthur D. CONSUMPTION OF NATIVE FORAGE SPECIES BY CAPTIVE MULE DEER DURING SUMMER. Journal of Range Management 6(1): 30-37, graph. Jan. 1953.
Quantitative results of experiments at Logan, Utah. Quantities of food eaten, preferences, and seasonal trends are discussed. Food habits of sheep and deer are compared. Deer are less partial to forbs than are sheep, but large amounts of browse and forbs are eaten by both. In the fall both species depend largely on browse.

Smith, Justin G., and Odell Julander. DEER AND SHEEP COMPETITION IN UTAH. Journal of Wildlife Management 17(2): 101-112, map and graph. April 1953.
Careful studies at different seasons revealed much competition between deer and sheep. In large part, deer and sheep fed on the same species and in the same areas. If deer populations had been reduced, sheep populations could have been increased.

Swift, Ernest. DEER HERD CONTROL METHODS AND THEIR RESULTS. 41st Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 10-11, 1951, Rochester, N. Y. 126-133 p. 1951.
History of the long and bitter campaign for herd control in Wisconsin. Fact-finding, demonstration, and education are indispensable, but equally important is to make sure that personnel of the department is convinced. Regional control is attempted by opening or closing different areas and by permitting only shotguns with slugs in some areas, rifles in others. Genuinely controlled hunts could not be administered statewide and would not be accepted by the public.

MAMMALS--DEER--Continued

Taber, Richard D. THE SECONDARY SEX RATIO IN ODOCOILEUS. Journal of Wildlife Management 17(1): 95-97. Jan. 1953.
Compilation of data on sex ratio at birth in several forms of the genus. The general tendency is for males to outnumber females by from 10 to 20%. Information on prenatal mortality is discussed.

Taber, Richard D. STUDIES OF BLACK-TAILED DEER REPRODUCTION ON THREE CHAPARRAL COVER TYPES. California Fish and Game 39(2): 177-186, illus. April 1953.
Examination was made of 38 does representing 3 cover types: mature chaparral, chaparral interspersed with herbaceous cover, chaparral heavily burned 2 years before. Reproduction was best in the interspersed type, poorest in the mature type. Does first bred at about 17 months, some later. Fertilization rate (ratio of corpora lutea to embryos) was 94%. No prenatal mortality was found. Productivity varied with age of doe as well as with habitat. Time of conception varied with age of doe to some extent.

Tyson, Edwin L. ESTIMATING DEER POPULATIONS FROM TRACKS: A PRELIMINARY REPORT. Presented at 6th Annual Conference, Southeastern Association of Game and Fish Commissioners, Oct. 19-22, 1952, Savannah, Ga. 1-15 p., graphs. 1952. [Available from J. H. Jenkins, U. of Ga., Athens.]
From track counts in sandy roads at Eglin Air Force Base, western Florida, the author estimated total number of deer in area. Estimates of this type proved more accurate than that based on a drive in which some men were too far apart. Track-based estimates require knowledge of diurnal range and movement patterns of deer. These were gained from observations of certain recognizable individuals and by trailing with dog. Formulas for estimates are provided. With knowledge of fawn crop and hunter kill it is possible to estimate populations at various seasons. It is interesting to note that at Eglin Base, long protected from fire, the longleaf pine fire climax is being succeeded by hardwoods that provide better deer, turkey, and squirrel range.

Woolfolk, E. J. SOME OBSERVATIONS ON A WHITE-TAILED DEER WINTER RANGE IN IDAHO. U. S. Forest Service, Northern Rocky Mountain Forest and Range Experiment Station (Missoula, Mont.), Research Note no. 116. 1-4 p. Feb. 1953.
Deer were scarce in the area studied and suffered winter losses despite an apparent abundance of browse. Quantitative study of browse by the line intercept method, combined with palatability ratings, revealed that little of the browse was of much value. Food shortage could easily materialize when snow was deep. Deer populations should be kept adjusted to quantity of useful browse rather than to total browse.

MAMMALS--MARINE

Ash, C. E. HVALENS VEKT. Norsk Hvalfangst-Tidende, Årg. 41, Nr. 7: 364-70, 373-74. 1952. [From Polar Record 6(45).]
"Formulae for calculating weight of whales. In Norwegian and English."

Bertram, George Colin Lawdor. THE PRESENT STATUS OF THE MARINE MAMMALS. Journal of the Society for the Preservation of the Fauna of the Empire, New Series, Part 61: 10-14, illus. March 1950. [From Polar Record 6(45).]
"Population and Commercial hunting: chiefly about whales and seals."

Blyth, J. D. M., editor. THE POLAR RECORD. Published by Cambridge University Press for Scott Polar Research Institute, Lensfield Road, Cambridge, England. 7s. 6d. per copy.
Workers concerned with marine animals, especially economically important mammals, will find many references in the long literature lists included in each issue of this semiannual journal. Few of these references can be listed in Wildlife Review. Polar Record's coverage of papers on marine mammals and products obtained from them appears to be good. Brief annotations are given for practically all titles. Most references listed in Polar Record are not biological, however, and arrangement is alphabetical by author rather than by subject. Copies of literature lists can be purchased separately for clipping and pasting on cards. Price of lists is 2s. 6d. for 2 reprints.

MAMMALS--MARINE--Continued

Kellogg, W. N., Robert Kohler, and H. N. Morris. PORPOISE SOUNDS AS SONAR SIGNALS. Science 117(3036): 239-243, illus. March 6, 1953.
Good circumstantial evidence that the bottle-nose dolphin uses echo-ranging.

Mackintosh, N. A. THE MARKING OF WHALES. Nature 169(4298): 435-437. March 15, 1952.
Between 1932 and 1938 more than 5,000 whales were marked with stainless steel tubes fired into them by shotgun. This article discusses some of the results and pleads for continuation of the work. It is interesting to note that blue, fin, and humpback whale populations have their own territories and migration routes separate from those of other populations of the species. Local depletion may thus have long-lived consequences.

Minner, J. Lester. OLD MAN OF THE ICE FLOES. Alaska Sportsman 19(3): 18-21, 38-39, illus. Mar. 1953.
Popular account of walrus habits, and of hunting and utilization of walrus by Eskimos. The herds are now seriously depleted. "There are probably still enough walruses left to meet Eskimo needs and at the same time to rebuild the herds to optimum numbers, but only if game laws prohibiting walrus hunting by white men are strictly enforced. It is desirable, also, that Eskimo hunters confine their taking of ivory only to that from animals needed for meat." At present, large numbers are killed simply for their ivory.

Mizue, Kazuhiro, and Tadashi Murata. BIOLOGICAL INVESTIGATION ON THE WHALES CAUGHT BY THE JAPANESE ANTARCTIC WHALING FLEETS SEASON 1949-50. Sci. Repts. Whales Research Inst. (Tokyo) no. 6. 73-131 p., illus. Dec. 1951. [From Journal of Mammalogy 34(2).]

Moore, Joseph Curtis. DISTRIBUTION OF MARINE MAMMALS TO FLORIDA WATERS. American Midland Naturalist 49(1): 117-158, illus. Jan. 1953.
A simple key to all marine mammals recorded for or expected in Florida waters is provided. Previous occurrence records are analyzed and new ones are given. Data on breeding, migration, and other habits are included for some species, and measurements of bodies or skulls are given for several species. There are photographs of living animals and of skulls, and there are maps of distribution records.

Nishiwaki, Masaharu. ON THE PERIODIC MARK ON THE BALEEN PLATES AS THE SIGN OF ANNUAL GROWTH. Sci. Repts. Whales Research Inst. (Tokyo) no. 6. 133-152 p., illus. Dec. 1951. [From Journal of Mammalogy 34(2).]

Orr, Robert T. BEAKED WHALE (MESOPLODON) FROM CALIFORNIA, WITH COMMENTS ON TAXONOMY. Journal of Mammalogy 34(2): 239-249, illus. May 1953.

Quiring, D. P., and Charles F. Harlan. ON THE ANATOMY OF THE MANATEE. Journal of Mammalogy 34(2): 192-203, illus. May 1953.

Rand, R. W. FUR SEALS. RESEARCH AND MANAGEMENT. Commerce & Industry, Official Jour. Dept. Commerce & Industries (Pretoria, South Africa), 11(1): 35-40, illus. Sept. 1952. [From Journal of Mammalogy 34(2).]

Thompson, Seton Hayes. ALASKA FISHERY AND FUR-SEAL INDUSTRIES: 1949. U. S. Fish & Wildlife Service, Statistical Digest no. 26. iv + 68 p., illus. 1952.

Wheeler, E. P., 2nd. NOTES ON PINNIPEDIA. Journal of Mammalogy 34(2): 253-255. May 1953.
Observations on characteristics, behavior, and Eskimo names in Northern Labrador.

MAMMALS--MARINE--Continued

Wilke, Ford. PELAGIC FUR SEAL RESEARCH OFF JAPAN IN 1950. General Headquarters, Supreme Commander for the Allied Powers (Tokyo), Natural Resources Section, Preliminary Study no. 67. 1-35 p., mimeo. Oct. 1951.
Collection of 453 fur seals at sea gave data on weights, ages, reproduction, coastal movements, segregation of sexes, probable size of population, occurrence in relation to water temperature, taxonomy, food habits, poaching, nature and effect of pelagic sealing. About 1/5 to 1/10 of the fur seals wintering off Japan were from the Pribilofs. Total population was somewhat over 125,000 but is being reduced by current practices. Studies of stomach contents revealed that most fishes and squids eaten were not economically important. Statistical analyses demonstrated that no taxonomic separation of North Pacific fur seals is justified.

BIRDS--GENERAL

Barth, Edvard K. CALCULATION OF EGG VOLUME BASED ON LOSS OF WEIGHT DURING INCUBATION. Auk 70(2): 151-159. April 1953.
Suggests new formula that is independent of shape of egg and is usable for eggs of all species. Only equipment needed is small scale and a container for a water test.

Blake, Charles H. TURNOVER RATIOS. Bird-Banding 24(1): 7-10. Jan. 1953.
How to calculate length of time migrating birds stay at a banding station.

Brooks, Maurice. A CONVENIENT METHOD OF CONFINING LIVE BIRDS FOR WEIGHING. Auk 70(2): 215. April 1953.
Birds are placed in sections of glass tubing of appropriate diameter. Weight of each tube is marked on it.

Brownlow, H. G. THE DESIGN, CONSTRUCTION AND OPERATION OF HELIGOLAND TRAPS. British Birds 45(11): 387-399, illus. Nov. 1952.
This is a large, wire-mesh trap for the capture of numbers of small birds at concentration points. It is usually a permanent installation, but a portable version is also described. Diagrams and many helpful suggestions are given.

Chisholm, A. H. BIRD-INSECT NESTING ASSOCIATIONS IN AUSTRALIA. Ibis 94(3): 395-405. July 1952.

Griswold, John A. HOW LONG DO BIRDS LIVE? Modern Game Breeding and Hunting Club News 23(4): 4 unnumbered p., illus. April 1953.
Gives many longevity records for captive birds, particularly from the Philadelphia zoo. Few parrots live more than 30 years, but one cockatoo lived to 56. Eagles and vultures may live in captivity for over 40 years. Records of 25-30 years are numerous for large water birds. The avian longevity record is said to be held by a European eagle owl that lived for 68 years. [See also Breland, p. 8 of this issue of WR.]

Hanson, Harold C. AIDS FOR THE EXPLORATION OF THE AVIAN CLOACA FOR CHARACTERS OF SEX AND AGE. Journal of Wildlife Management 17(1): 89-90, illus. Jan. 1953.
Medical instruments for expanding, lighting and probing the cloaca.

Irwin, Raymond. BRITISH BIRD BOOKS: AN INDEX TO BRITISH ORNITHOLOGY, A.D. 1481 TO A.D. 1948. Grafton & Co., London. 1951. 63s. [From review by W. B. A., British Birds 45(3).]
"...it indexes and classifies, not only books, but chapters in books, scientific papers and articles in magazines and newspapers."

Johansen, Hans. ORNITHOLOGY IN RUSSIA. Ibis 94(1): 1-48. Jan. 1952.
Ornithological work in Russia has proceeded along much the same lines as it has in other countries. An enormous amount of good work has been published in many fields, including economic relationships of birds, biology of game birds, population fluctuations and population dynamics of game birds. The author lists some 500 Russian papers, with titles given in English, French, or German.

BIRDS--GENERAL--Continued

Pough, Richard H. BIRD PROTECTION IN THE UNITED STATES. Passenger Pigeon 14(4): 141-145, 148. Winter 1952.
Plume hunting and egg collecting are virtually things of the past. Oil pollution of coastal waters is much reduced. Many birds are well protected by public sentiment. The number of refuges is growing and game management is progressing. Soil conservation and range improvement measures favor certain species. On the other hand, destruction of habitat is proceeding rapidly. The last virgin swamp forests of the South are being cut and there is no plan to save a single part of them. Certain birds (including eagles) cannot find enough large trees for nesting in many areas. Swamps and marshes are being drained or flooded wholesale. Clean farming is reducing farmland wildlife. Grassland birds are endangered by overgrazing and cultivation; at least one, the masked bobwhite, is gone. Waterfowl habitat is being lost much faster than it is being created. Birds of prey are still shot promiscuously; the Everglades kite nearly has been exterminated. Hawk protection laws are improving but are largely ineffective, and more education is the only solution.

Preston, F. W. THE SHAPES OF BIRDS EGGS. Auk 70(2): 160-182, illus. April 1953.
Mathematical descriptions of eggs of various birds. Methods are stressed.

Shaub, B. M. A DEVICE FOR REMOVING OVERLAPPED BANDS FROM BIRD'S LEGS. Bird-Banding 24(1): 12-14. Jan. 1953.

Reed, Parker C. DANGER OF LEG MUTILATION FROM THE USE OF METAL COLOR BANDS. Bird-Banding 24(2): 65-67, illus. April 1953.
"Where two metal bands are mounted one over the other on the same leg, the lower one will flatten and thicken until it is a hazard to the bird's leg, if not its life."

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Austin, Oliver L., Sr. THE MIGRATION OF THE COMMON TERN (STERNA HIRUNDO) IN THE WESTERN HEMISPHERE. Bird-Banding 24(2): 39-55, maps. April 1953.

Ball, Stanley C. FALL BIRD MIGRATION ON THE GASPÉ PENINSULA. Peabody Museum of Natural History, Yale University, New Haven, Conn. vii + 211 p., illus. 1952. $5.00. [From American Scientist 41(2).]

Cott, Hugh B. THE PALATABILITY OF THE EGGS OF BIRDS: ILLUSTRATED BY THREE SEASONS' EXPERIMENTS (1947, 1948 AND 1950) ON THE FOOD PREFERENCES OF THE RAT (RATTUS NORVEGICUS); AND WITH SPECIAL REFERENCE TO THE PROTECTIVE ADAPTATIONS OF EGGS CONSIDERED IN RELATION TO VULNERABILITY. Proceedings of the Zoological Society of London 122(1): 1-54, illus. May 1952.
Palatability of a given type of bird egg seems much the same for man, rat, and hedgehog. In general, the most distasteful eggs are those that otherwise are the least protected; many of these are distinctively marked, in accordance with the theory of warning coloration.

Eyster, Marshall Blackwell. QUANTITATIVE MEASUREMENT OF THE INFLUENCE OF PHOTOPERIOD, TEMPERATURE, AND SEASON ON THE ACTIVITY OF CAPTIVE SONGBIRDS. Ph. D. thesis, University of Illinois. 112 p. 1952. [From long abstract in Dissertation Abstracts 13(1).]

Farner, Donald S., and L. R. Mewaldt. THE RECORDING OF DIURNAL ACTIVITY PATTERNS IN CAGED BIRDS. Bird-Banding 24(2): 55-65, illus. April 1953.
Activity cage with electric recording system.

Fitz Patrick, James L. G. SOME THOUGHTS ON NATURAL FLIGHT. Technology Review 54(1): 21-24. Nov. 1951. [From review by R. O. Bender, Bird-Banding 24(1).]
A readable review paper that examines natural flight from an engineering viewpoint. The author points out that "nature's flying machines ignore many of precepts of conventional engineering."

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION--Continued

Fitz Patrick, James L. NATURAL FLIGHT AND RELATED AERONAUTICS. Inst. Aernautical Sci. (2 E. 64th St., N. Y.). 1-118 p. 1952. $3.50. [From review by H. I. Fisher, Auk 70(1).]

"This is a bibliography of papers, not annotated, on bird flight; the first reference goes back to 400 B. C., and the last ones are those of 1952. The some 1500 citations are arranged in alphabetical sequence by years. The slight difficulty thus brought about in searching for particular titles or authors is more than compensated for by excellent author and subject indices. There is also an historical index, as well as an index to patents relating to devices simulating the beating wing. All explanatory material is given in English, French, and German."

Hagen, Yngvar. TOTAL WEIGHT STUDIES OF NORWEGIAN BIRDS (Tatalgewichts-Studien bie Norwegischen Vogelarten). Archiv für Naturgeschichte, N.F. Bd. 11, Heft 1-2: 1-173. 1942. [From long review by Kaj Westerskov, Journal of Wildlife Management 17(1).]

Probably the finest paper on bird weights. Average and extreme weights are given for 123 species, some of which occur in America. 3144 individuals were weighed. A condition factor, based on degree of fatness, was established. Topics include: weights of closely related species, sexual weight relationships, individual variation, lower weight limits, adjustments of predators to varying food conditions, seasonal and longer period weight variations. Death usually occurs when weight goes down to 50% of normal. Winter weights are better than often thought, highest of the year in some predators. Average ptarmigan weights gradually declined 1916-34. Bibliography gives comprehensive list of European references on bird weights.

Jenner, Charles E., and William L. Engels. THE SIGNIFICANCE OF THE DARK PERIOD IN THE PHOTOPERIODIC RESPONSE OF MALE JUNCOS AND WHITE-THROATED SPARROWS. Biological Bulletin 103(3): 345-355, illus. Dec. 1952.

"The results show clearly that in the photoperiodic response of these birds there is a critically important dark-dependent phase. This dark-period dependence appears to be characteristic of all photoperiodic responses, in both plants and animals."

Kendeigh, S. Charles. PARENTAL CARE AND ITS EVOLUTION IN BIRDS. University of Illinois, Ill. Biological Monographs, vol. 22. x + 356 p., illus. 1952. $4.00 paper, $5.00 cloth. [From review in Journal of Wildlife Management 17(2).]

"Students of bird behavior and life histories will find this book an exceedingly valuable compendium of information on the behavior of birds during nest-building, incubation, and the period of caring for the young. The literature has been covered through 1950, and the 40-page 'literature cited' section will be of particular value to students. Readers of the Journal will be especially interested perhaps in the sections on game birds, which are brief, but do cover the most important literature in the field." The house wren is given most attention because of the author's long work with it.

Kramer, Gustav. EXPERIMENTS ON BIRD ORIENTATION. Ibis 94(2): 265-285, illus. April 1952.

Tells of experiments reported by the author and others in several German papers. Strong evidence is given that birds can orient themselves from the position of the sun, and that they can compensate for changes of sun position during the day. As G. E. Hutchinson has said [American Scientist 40(4)] in commenting on this paper, "The conclusion seems inescapable that the astronomical analyser provides a sort of inherent time sense, equivalent to that of the clock rotating a telescope, which enables the bird at different times of day to correct the observed solar azimuth to some direction of particular significance in its migratory or feeding activities."

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION--Continued

Leopold, A. Starker. INTESTINAL MORPHOLOGY OF GALLINACEOUS BIRDS IN RELATION TO FOOD HABITS. Journal of Wildlife Management 17(2): 197-203, illus. April 1953.

Measurements for many species prove that browsers (grouse) have proportionately longer intestines than seed-eaters (quail, pheasant, turkey). The caecum is far larger in the browsers. These specializations in grouse presumably provide storage space for bulky, low grade food to undergo microbial decomposition of cellulose. Coast and interior races of California quail, which differ in quality and type of food, also differ in length of caecum and intestine.

Marshall, A. J. FOOD AVAILABILITY AS A TIMING FACTOR IN THE SEXUAL CYCLE OF BIRDS. Emu 50(4): 267-282. April 1951. [From review by R. S. Palmer, Bird-Banding 24(2).]

"After a detailed discussion of evidence from Australia and elsewhere, the main conclusion (p. 281) is that 'a genetically-determined response to widely-varying factors has evolved in some species in a way that ultimately gears the sexual cycle so that the young will hatch at times when the environment contains abundant food on which they are traditionally fed.' The importance of food supply in the origin and maintenance of bird movement, including migration, also is stressed. Bibliography of 61 titles."

Marshall, A. J. NON-BREEDING AMONG ARCTIC BIRDS. Ibis 94(2): 310-333, illus. April 1952.

Many Arctic birds fail to breed. The proportion of non-breeders varies with time and place, but may be large. The author studied this condition on Jan Mayen Island in the summer of 1947, using histochemical study of gonads and observation of environment. He concludes that non-breeding of adults is caused by unfavorable environmental factors acting on gonads through the pituitary. Unfavorable factors may be lack of safe nest sites because of high fox population, lack of breeding cover, shortage of food. [One wonders if this theory might not be applied to many other problems of breeding and populations. Basically, it explains how habitat conditions, including sociological factors, can affect breeding through their effect on an animal's nervous system.]

Matthews, G. V. T. THE EXPERIMENTAL INVESTIGATION OF NAVIGATION IN HOMING PIGEONS. J. Exp. Biol. 28: 508-535. 1951. [From Journal of Animal Ecology 22(1).]

"The ability of pigeons to orient, even when released off a training line, varies much between individuals and is inherited. Overcast skies definitely reduce this power but a simple use of a sun-time angle mechanism is excluded. Other hypotheses discounted involve: random search for landmarks, atmospheric clues, earth's magnetic field and displacement recording by a time-acceleration mechanism. A possible but unlikely navigation method is suggested. A helicopter and a radio-active flight recorder were used with moderate success."

Matthews, G. V. T. AN INVESTIGATION OF HOMING ABILITY IN TWO SPECIES OF GULLS. Ibis 94(2): 243-264. April 1952.

"...a large proportion of the gulls were homing by an inefficient method, probably random exploration for known visual landmarks...A minority were, however, homing by a method not dependent on the distance or area of release. Some form of sun navigation is suggested by the orientation behavior...Masking the earth's magnetic field by airborne magnets did not affect homing ability."

Miller, Loye. AUDITORY RECOGNITION OF PREDATORS. Condor 54(2): 89-92. March-April 1952.

Field experiments on bird reactions to simulated owl calls. Birds reacted chiefly to voices of owls that occurred in the area and were dangerous to them.

Milne, Lorus J., and Margery J. Milne. BIRD'S EYE VIEW. Natural History 61(6): 241-242. June 1952.

Tells of eye adaptations of various birds that permit them to see well under water. Three main systems are described.

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION--Continued

Montgomery, K. C., and Eric G. Heinemann. CONCERNING THE ABILITY OF HOMING PIGEONS TO DISCRIMINATE PATTERNS OF POLARIZED LIGHT. Science 116(3017): 454-456. Oct. 24, 1952.
It is unlikely that patterns of polarized light can be used in navigation of these birds.

Nelson, Arnold L., and Alexander C. Martin. GAMEBIRD WEIGHTS. Journal of Wildlife Management 17(1): 36-42, graphs. Jan. 1953.
Average and maximum weights for each sex of 80 American species. Size of sample varies greatly but is always stated.

Oakeson, Barbara Blanchard. CYCLIC CHANGES IN LIVER AND SPLEEN WEIGHTS IN MIGRATORY WHITE-CROWNED SPARROWS. Condor 55(1): 3-16, graphs. Jan.-Feb. 1953.

Rand, A. L. FACTORS AFFECTING FEEDING RATES OF ANIS. Auk 70(1): 26-30. Jan. 1953.

Rand, Austin L. SECONDARY SEXUAL CHARACTERS AND ECOLOGICAL COMPETITION. Chicago Natural History Museum. Fieldiana: Zoology 34(6): 65-70, illus. 1952. [Copy of review by "P.S.H." in Auk 70(2).]
"A stimulating discussion of the possible role, in some species of birds, of certain secondary sexual characters in the reduction of ecological competition between the sexes. Examples are given of behavioral differences tending to segregate the sexes at certain seasons, and of structural dimorphism (bill modifications, tail development, size) tending to produce sexual differences in food habits. This notion has a two-fold significance: a short-term one reducing intra-specific competition for food, and a long-term, evolutionary one tending to increase the sexual dimorphism within the species."

Skutch, Alexander F. ON THE HOUR OF LAYING AND HATCHING OF BIRDS' EGGS. Ibis 94(1): 49-61. Jan. 1952.

Wilkinson, D. H. FLIGHT RECORDERS. A TECHNIQUE FOR THE STUDY OF BIRD NAVIGATION. J. Exp. Biol. 27: 192-197. 1950. [From Review by D.W.S., Ibis 94(3).]
Describes a device that fits onto wings. "In flight alpha-particles from a radio-active substance fall onto a photographic emulsion; when the bird is at rest a gravity-operated device screens the emulsion." Thus one can tell how much time a homing bird spends in flight.

Wolfson, Albert. THE OCCURRENCE AND REGULATION OF THE REFRACTORY PERIOD IN THE GONADAL AND FAT CYCLES OF THE JUNCO. Journal of Experimental Zoology 121(2): 311-325, graph. Nov. 1952.
"It is concluded that the duration of refractory period in the junco is regulated by day length. Long days delay its termination and short days hasten it. Long days may possibly maintain it indefinitely."

BIRDS--MANUALS, FAUNAS, COMMUNITIES

Blake, Emmet Reid. BIRDS OF MEXICO. A GUIDE FOR FIELD IDENTIFICATION. University of Chicago Press (Chicago 37, Ill.) xxx + 644 p., illus. 1953. $6.00.
The avifauna of Mexico, with 89 families, 967 species, and about 2000 named forms, is larger than that of the U. S. and Canada. Blake's field guide treats all of the species in a volume about the size of Chapman's Handbook. Although it is not a Peterson-type guide and has black and white illustrations of only 329 species, it should be extremely useful. Birds are grouped by family, with a field key to the species of each family. For each species is given a carefully selected English name, scientific name, indication of size in inches, brief description (including main plumages), indication of breeding status, general statement of habitat and distribution, list of races and their general distributions, and remarks. "Remarks" pertain chiefly to diagnostic characters. Endpapers show the states and vegetational areas of Mexico. The book appears to be of great value to anyone who has at least a moderate knowledge of ornithology.

BIRDS--MANUALS, FAUNAS, COMMUNITIES--Continued

Fisher, James. BIRD RECOGNITION II. BIRDS OF PREY AND WATER-FOWL. Penguin Books, Harrison and Sons Ltd., Harmondsworth, Middlesex, England. 182 p., illus. 1951. 85¢. [From review by R. W. Storer, Auk 70(2).]

Second of 4 volumes on identification of British birds. Treats owls, hawks, herons, ducks, grebes, and loons. Species accounts discuss recognition, breeding, distribution, and migration. Illustrations include distribution maps, drawings of birds, graphs showing status of each species throughout year, chart showing usual habitat of each species, and drawings of many species in flight or in winter plumage. There are also a key to species and a list of extreme rarities.

Harper, Francis. BIRDS OF THE NUELTIN LAKE EXPEDITION, KEEWATIN, 1947. American Midland Naturalist 49(1): 1-116, illus. Jan. 1953.

Important monograph on many aspects of the ornithology of Northern Canada. Introductory sections describe area; discuss ornithocoprophilous lichens; compare littoral and inland avifaunas; consider postjuvenal molt, skull granulation, and migration; and give figures on relative abundance. Species accounts vary in length, but contain much information on life history, taxonomy, measurements, plumages, ectoparasites, and distribution. The 20-page section on ptarmigans would be a valuable contribution by itself. Important distributional records from Northwestern Canada are summarized for each species.

Manning, Thomas Henry. BIRDS OF THE WEST JAMES BAY AND SOUTHERN HUDSON BAY COASTS. National Museum of Canada, Bulletin no. 125. iv + 114 p., illus. 1952. [From Polar Record 6(45).]

"Systematic list; distribution: observations mostly since 1947."

Stoner, Dayton, and Lillian C. Stoner. BIRDS OF WASHINGTON PARK, ALBANY, NEW YORK. N. Y. State Museum Bulletin 344. 1-268 p., illus. 1952. [From review by "R.W.S." in Auk 70(2).]

"This intensive study of the birds of a city park was initiated by the Stoners in 1933...One hundred-and-twenty-two species and subspecies are included in the accounts which contain valuable information on migration dates, frequency of occurrences, and habits."

BIRDS--NUMBERS AND NUMBER FLUCTUATIONS

Haartman, Lars von. THE PIED FLYCATCHER. II. POPULATION PROBLEMS. (Der Trauerfliegenschnäpper. II. Populationsprobleme.) Acta Zoologica Fennica 67: 1-60. 1951. [From review by D. S. Farner, Bird-Banding 24(1).]

According to Farner, "This treatise is a contribution of major significance to the study of population dynamics." Among topics taken up are population fluctuations, annual adult mortality, survival, ages, relation of clutch size to age of female and to percentage of eggs resulting in fledglings, rates of reproduction and survival needed to maintain constant population.

Lack, David. REPRODUCTIVE RATE AND POPULATION DENSITY IN THE GREAT TIT: KLUIJVER'S STUDY. Ibis 94(1): 167-173. Jan. 1952.

Summarizes Kluijver's epochal paper (see WR 70: 33) and then goes into a stimulating discussion of the relationship between population density, clutch size, and habitat conditions. Lack postulates that clutch size is reduced to some extent by high populations, but that both are closely adjusted to the food situation. Mechanisms of the adjustment are unknown. Size of territories is smaller in more favorable habitats.

BIRDS--PARASITES AND DISEASES

Borg, Karl. ON LEUCOCYTOZOON IN SWEDISH CAPERCAILLIE, BLACK GROUSE AND HAZEL GROUSE. Communication from the State Veterinary Medical Institute, Stockholm 50, Sweden (Berlingska Boktryckeriet, Lund). 1-109 p., illus. 1953.

In English. A detailed study with 133 references. The disease was found to be common but not serious. Taxonomy and distinctions from Toxoplasma are discussed, as are life history, diurnal and seasonal variations, and distribution.

BIRDS--PARASITES AND DISEASES--Continued

Bullock, Wilbur L. TWO NEW SPECIES OF MONOSTOMES FROM THE CANADA GOOSE WITH A REVIEW OF PARAMONOSTOMUM ALVEATUM (MEHLIS IN CREPLIN, 1846). Journal of Parasitology 38(5): 371-378, illus. Oct. 1952.

Chernin, Eli. THE EPIZOOTIOLOGY OF LEUCOCYTOZOON SIMONDI INFECTIONS OF DOMESTIC DUCKS IN NORTHERN MICHIGAN. American Journal of Hygiene 56(1): 39-57, graphs. July 1952.

Chernin, Eli. THE RELAPSE PHENOMENON IN THE LEUCOCYTOZOON SIMONDI INFECTION OF THE DOMESTIC DUCK. American Journal of Hygiene 56(2): 101-118, graphs. Sept. 1952.

Chernin, Eli. PARASITEMIA IN PRIMARY LEUCOCYTOZOON SIMONDI INFECTIONS. Journal of Parasitology 38(6): 499-508, graphs. Dec. 1952.

I. C. I. Game Services. SOME DISEASES OF GAME BIRDS. I. C. I. Game Research Station, Burgate Manor, Fordingbridge, Hampshire, England. 1-29 p., illus. Revised Aug. 1951.
Symptoms, pathology, life history, treatment, and prevention of the common parasites and diseases of penned game birds in Great Britain.

Levine, Norman D., and Harold C. Hanson. BLOOD PARASITES OF THE CANADA GOOSE, BRANTA CANADENSIS INTERIOR. Journal of Wildlife Management 17(2): 185-196, illus. April 1953.
"In a study of blood smears from 353 Canada geese (Branta canadensis interior) collected at Horseshoe Lake Game Refuge, Illinois, Leucocytozoon simondi was found in 32 (9.1%), Haemoproteus sp. in 5 (1.4%), Plasmodium sp. (probably P. circumflexum) in 1 (0.3%) and microfilariae in 4 (1.1%). Two types of unsheathed microfilaria were found, one 65 and the other 332 microns long. Leucocytozoon was found in 27.6% of 76 juvenile geese, 5.4% of 112 yearlings, and 3.0% of 165 adults. Haemoproteus was found in no juveniles, 0.9% of the yearlings, and 2.4% of the adults. Microfilariae were found in 1.3% of the juveniles, 0.9% of the yearlings, and 1.2% of the adults."

Love, G. J., S. A. Wilkin, and M. H. Goodwin, Jr. INCIDENCE OF BLOOD PARASITES IN BIRDS COLLECTED IN SOUTHWESTERN GEORGIA. Journal of Parasitology 39(1): 52-57. Feb. 1953.

Priebe, Margaret Dye. ACANTHOCEPHALAN PARASITES OF WATERBIRDS IN EASTERN WASHINGTON. Transactions of the American Microscopical Society 71(4): 347-349. Oct. 1952.

BIRDS--UPLAND GAME--GENERAL

Anonymous. REVIEW OF SOUTH DAKOTA SMALL GAME CONDITIONS. South Dakota Conservation Digest 19(12): 1, 10, 16. Dec. 1952.
Breeding populations of upland game birds and waterfowl were good in the spring of 1952. Pheasant and grouse hatch was good and about a week early. An extremely dry summer caused considerable juvenile mortality, for broods concentrated in the little cover available, where they were exposed to an unusual amount of predation and disease. Nevertheless, grouse hunting was twice as good as in 1951. Grouse hunters averaged 2 hours per bird and 2.2 birds per day. Age ratio was 1.8 young per adult. Pheasant hunting was good, hunters averaging 1.3 hours per bird, and 2.7 birds per day. Local variations are discussed. Waterfowl were numerous but relatively less productive than the smaller populations of 1951, although total production was higher in 1952. Fine weather in 1952 caused poor waterfowl hunting.

BIRDS--UPLAND GAME--GENERAL--Continued

Greenhalgh, Clifton M., and R. Lynn Nielson. UTAH GAME BIRD HARVEST 1952. Utah Department of Fish and Game, Departmental Information Bulletin no. 7 of the Federal Aid Division. 1-62 + 18 p. appendix. April 1953.

Chief game bird is pheasant. Pressure on quail and mourning dove was light in 1952, with most quail shot by pheasant hunters. Sage grouse were hunted only by permit in special areas. Pressure on pheasant was up but kill was not. Average bag of pheasants for season was 3.13. Hunters did no better in special posted hunting units than elsewhere. Text and numerous tables supply information on: how data were gathered and computed; analysis of pheasant hunting pressure and source of hunters; comparative success of hunters with dogs; hunting statistics (by county or unit) for pheasant, quail, and dove; age ratios for pheasant and dove.

N. J. Wildlife Management Division. WHAT DO THEY EAT? New Jersey Outdoors 3(8): 15-17, 23-24, illus. Feb. 1953.

Lists foods by seasons for pheasant and ruffed grouse, and lists numerous foods of bobwhite. Sources of data not stated.

Thompson, Donald R., and Charles W. Lemke. AUDIO CENSUS OF SOME WISCONSIN GAME BIRDS. Presented at 14th Midwest Wildlife Conference, Des Moines, Iowa, Dec. 17-19, 1952. 1-8 p. + 3 graphs. 1952.

Based on listening-stop transects made by car. Nearly all ruffed grouse that are going to drum can be located in a 5-minute stop. In 3 minutes, however, number of drums heard approximates number of individuals that can be located in 5 minutes. In a stop of given length, "the number of drums per bird appears to remain constant irrespective of high and low populations and irrespective of whether drumming is at a seasonal peak or not." Average variation between first and last stops is only 20% above and below general mean. Pheasant call-count transects are run from ½ hour before to 3/4 hour after sunrise, with 2-minute stops. Within this period, variation about the average is 20% in Wisconsin and Iowa, but 7% in South Dakota, possibly because of less noise in the latter state. It is shown that distribution of pheasant cocks and their crowing is not random, does not follow a Poisson curve. Possible explanations are discussed.

Williamson, Leslie A. STATUS OF COMMERCIAL GAME BREEDING IN THE UNITED STATES: SUMMARY OF REPLIES TO QUESTIONNAIRE. 1-9 p., mimeo. STATUS OF GAME BREEDING IN THE UNITED STATES AND MARKETING LIVE GAME BIRDS. 1-8 p., mimeo. Both issued by Connecticut State Board of Fisheries and Game, Feb. 1953.

The first paper listed consists of tabulations of data from questionnaires returned by 34 states. Information requested was: 1. Number of licensed game breeders in state, 1947-51. 2. Number of birds reared by these breeders. 3. Does state permit sale of pheasants and quail as food? 4. If so, what restrictions are placed on such sale? 5. Does state permit private shooting preserves or controlled hunting areas? 6. If so, what was number of such areas, 1947-51? 7. Number of pheasants and/or quail liberated on these areas, 1947-51. Few states were able to give complete replies. The second paper discusses questionnaire results and suggests commercial outlets: sale for food, to private shooting preserves, for dog trials. Private game breeding is increasing. Reports from 30 states show a total of nearly 7,000 breeders. It is estimated that breeders of 29 states reared about 617,000 pheasants in 1951.

BIRDS--QUAIL

Anonymous. QUAIL STOCKING FAILURE. Alabama Conservation 24(5): 26, illus. March-April 1953.

Reviews experience of Oklahoma and Kentucky and concludes that Alabama's has been no better. At present rearing costs, and with Oklahoma's rate of recovery of released birds, each pen-reared quail bagged would cost $315. These quail cannot care for themselves in the wild, and their release actually may result in lower rather than higher populations.

BIRDS--QUAIL--Continued

Gooden, Samuel K. WINTER BEHAVIOR OF THE EASTERN BOBWHITE, COLINUS V. VIRGINIANUS L., ON THE DECATUR COUNTY RESEARCH AREA, 1951-1952. M. S. Thesis, Iowa State College. 1952?

Goodrum, Phil, and V. H. Reid. QUAIL MANAGEMENT ON FORESTED LAND. Presented at 6th Annual Conference, Southeastern Association of Game and Fish Commissioners, Oct. 19-22, 1952, Savannah, Ga. 1-4 p. [Available from J. H. Jenkins, U. of Ga., Athens.]

Similar to earlier paper (see WR 71:36). Modern farming in the South has greatly reduced quail on farms but fair populations remain in cut-over pine lands. There chances for management are good. Recommendations include controlled burning, ploughing, and planting food plants. Cattle also benefit. Planted strips should radiate out from creeks, bay galls, and springheads, which quail frequent. Rainfall well distributed through growing season favors production of quail foods and quail, though too much summer rain gave opposite effect in a Florida study.

Harvey, Julian C. WHAT IS THE FATE OF OUR FALL QUAIL COVEYS? Virginia Wildlife 14(3): 8-9, 22, illus. March 1953.

Studies in Virginia demonstrated that winter populations are limited by carrying capacity; this in turn depends on proper interspersion of habitats supplying food and the needed types of cover. A few suggestions are given for improving farm areas for quail.

Herndon, Paul. THE QUAIL WING SURVEY. Tennessee Conservationist 19(5): 18-19, illus. May 1953.

Bobwhite age ratios in birds bagged in the 1952-53 season. Percentage of juveniles was lower (72%) than in previous year (84%). Quail hunting in Tennessee is not getting any better; much habitat improvement is needed if hunting is to improve.

Kirkpatrick, Charles M., and Harold E. Moses. THE EFFECTS OF STREPTOMYCIN AGAINST SPONTANEOUS QUAIL DISEASE IN BOBWHITES. Journal of Wildlife Management 17(1): 24-28. Jan. 1953.

Streptomycin greatly reduces enteritis losses among game farm birds and its use is economically justifiable. Details of treatment and results are given.

Lewis, John B. SEASONAL MOVEMENTS OF BOBWHITES IN CENTRAL MISSOURI. Presented at 14th Midwest Wildlife Conference, Des Moines, Iowa, Dec. 17-19, 1952. 1-2 p. 1952.

Abstract of report on continued study of trapped and banded quail. For earlier report see Murphy and Baskett, 1952 (WR 71:37). Movement was greatest in spring, less in summer, least in fall and winter. Most quail remained within 1/2 mile of point where first trapped, but about 1/3 of them moved further than this in spring and summer. Management areas, therefore, should be large. Southeastern quail studied by Stoddard apparently were more sedentary.

Moreau, R. E. THE BRITISH STATUS OF THE QUAIL AND SOME PROBLEMS OF ITS BIOLOGY. British Birds 44(8): 257-276. Aug. 1951.

Much information on the quail Coturnix coturnix.

Reeves, Maurice C. BOBWHITE QUAIL PRODUCTION IN INDIANA. Presented at 14th Midwest Wildlife Conference, Des Moines, Iowa, Dec. 17-19, 1952. 1-5 p. 1952.

Study of habitat needs of wild quail and of survival of pen reared quail. Highest populations occurred where there was good interspersion of cropland and cover. Results of 831 analyses of crop contents are summarized. Drop in growing of Korean lespedeza lowered quail populations. Release of 8-week old quail gave 3.3% return. Release of 14-17-week old quail gave 11.6% return. Of 168 quail 8-17 weeks old released on study area in summer and early fall, 22.6% were known to be alive when season opened. It is estimated that at this rate pen reared quail would be 51% as effective as wild ones. However, if all pen reared quail released in Indiana in the last 20 years survived equally well, they would have represented less than 1% of the annual harvest and would have cost 40% of the amount paid for licenses by quail hunters.

BIRDS--QUAIL--Continued

Yocom, Charles F., and Stanley W. Harris. FOOD HABITS OF MOUNTAIN QUAIL (OREORTYX PICTA) IN EASTERN WASHINGTON. Journal of Wildlife Management 17(2): 204-207, illus. April 1953.
Briefly discusses population fluctuations and habitat and lists many foods found in 26 crops and 27 gizzards of birds collected in fall and winter. Leading food was fruits of smooth sumac.

BIRDS--PHEASANTS

Blouch, Ralph I., and Lee Eberhardt. SOME HATCHING CURVES FROM DIFFERENT AREAS OF MICHIGAN'S PHEASANT RANGE. Presented at 14th Midwest Wildlife Conference, Des Moines, Iowa, Dec. 17-19, 1952. 1-4 p. + 1 map, 7 graphs. 1952.
Should be of interest to all workers responsible for interpreting data from wings of birds shot. In this study, both wings and feet were sent in by hunters. Juveniles were recognized by spur characters and their hatching dates were determined by stage of molt of primaries. Hatching dates (1950 and 1951) were plotted for 5 natural areas of state. The poorest area for pheasant production had earliest and narrowest distribution, steepest upward climb, highest peak, and most uniform downward slope. The best area had the widest and latest hatching distribution. Further analysis revealed local differences in the best area, with 2 distinct curves. A low point in one curve cannot be explained by weather and is tentatively attributed to disturbance by ploughing.

Carter, Glen David. FACTORS AFFECTING SURVIVAL OF RING-NECKED PHEASANTS ON THE DESCHUTES IRRIGATION PROJECT OF OREGON. M. S. thesis, Oregon State College. 61 p. 1952.

Corthell, Robert Ashley. COMPARATIVE WINTER SURVIVAL OF WILD AND GAME FARM PHEASANTS ON ELIZA ISLAND, WASHINGTON. Master's thesis, Oregon State College, 1950.

Grondahl, Carroll Robert. WINTER MOVEMENTS OF THE RING-NECKED PHEASANT, PHASIANUS COLCHICUS TORQUATUS (GMELIN), IN WINNEBAGO COUNTY, IOWA. M. S. thesis, Iowa State College, 1952.

Hansen, Charles Goodman. COMPARATIVE WINTER SURVIVAL OF WILD AND GAME-FARM PHEASANTS WITH PREDATOR CONTROL PRACTICED ON ELIZA ISLAND, WASHINGTON. M. S. thesis, Oregon State College. 99 p. 1952.

Hoffman, Russell Raymond. A PHEASANT NESTING STUDY WITH CONTROLLED PREDATION ON ELIZA ISLAND, WASHINGTON. Master's thesis, Oregon State College, 1950.

Klonglan, Eugene D., and Edward L. Kozicky. VARIATIONS IN TWO SPRING INDICES OF MALE PHEASANT POPULATIONS, STORY COUNTY, IOWA. Presented at 14th Midwest Wildlife Conference, Des Moines, Iowa, Dec. 17-19, 1952. 1-4 p. + 2 graphs. 1952.
Statistical analysis of field data indicated that there is more variation in crowing counts and male roadside counts in an area of low pheasant population (20 per square mile) than in an area of higher population (50 or more per square mile). Sex ratios were similar in the areas. Crowing varies greatly with time of day; censuses should be made at same time in relation to sunrise. Need of study of other factors affecting counts is pointed out.

Lyon, Jack L. REVIEW OF LITERATURE. PHEASANT NESTING AND PRODUCTION, AND THE EFFECTS OF WEATHER, COVER REDUCTION, AND AGRICULTURAL LAND-USE ON NESTING SUCCESS. Colorado Cooperative Wildlife Research Unit and Colorado Game and Fish Department. 1-52 p., mimeo. Aug. 1952.
A useful compilation that brings together facts, figures, and conclusions from most American research projects on pheasant nesting and production. Discussions cover such topics as sex ratios, period of nest establishment, laying and hatching peaks, nest-cover preference, nesting success, causes of nest destruction, average clutch size, fertility and hatching, brood size and success, percentage

BIRDS--PHEASANTS--Continued

of hens successful, and factors affecting production. Although Lyon has not attempted to make critical evaluation of research techniques or reliability of findings, his review undoubtedly will be of considerable value to pheasant research workers, especially those who do not have adequate library facilities.--Fred H. Dale.

Madden, Elwood. LANDOWNERS' OPINIONS ON THE ESTABLISHMENT OF PHEASANTS ON A NEW CENTRAL OREGON IRRIGATION PROJECT. M. S. thesis, Oregon State College. 59 p. 1953.

Resler, George W. COOPERATIVE PHEASANT PROGRAM. Wisconsin Conservation Bulletin 18(5): 7-11, illus. May 1953.

Comprehensive account of Wisconsin's pheasant stocking program in which nearly 200,000 chicks per year are distributed to clubs for rearing. Birds must be properly released in the best available habitat if good results are to be obtained.

Sjordal, James. PHEASANTS AND WEATHER IN THE NORTH EAST. North Dakota Outdoors 15(10): 4-5, graphs. April 1953.

Evidence that pheasant populations in northeastern North Dakota have been seriously reduced by recent winters that were unusually cold and had exceptionally high snowfall. Need of good winter cover, and ways of getting it, are explained.

Stanz, Harry E., Jr. IMPROVED RATIONS AND FEEDING PROCEDURES FOR PHEASANTS. Wisconsin Conservation Department, Technical Wildlife Bulletin no. 3. 1-13 p. 1952.

Discusses nutritional needs of captive pheasants and describes several practical rations.

Taylor, E. W. PHEASANT FACTS FROM THE POSTAL SURVEY. Report of Proceedings, 6th Annual Game Convention, Vernon, B. C., May 7-10, 1952. British Columbia Game Department, Victoria, B. C. 70-86 p., tables and graphs. 1952.

Trimm, Lynn. RED IS AN INTERESTING COLOR. Audubon Magazine 55(1): 16-18, illus. Jan.-Feb. 1953.

Male pheasants whose cheek patches are large and bright red (naturally or painted) have advantage in combat and mating. Females with cheek patches painted on are attacked as males.

Wagner, Fred H. ARE WE OVERSHOOTING OUR PHEASANT COCKS? Wisconsin Conservation Bulletin 18(1): 13-15. Jan. 1953.

Fears that too many cocks are being shot are groundless. Review of literature reveals no record of so many cocks being shot that reproduction was impaired. In fact, it appears that highly distorted sex ratios are an indication of high populations. Sex ratios in several Wisconsin counties varied from 1.5 cocks per hen to 1 cock per 10 hens, but reports of "no cocks" came from some of these counties. "During the winter of 1950-1951, the state-wide average was 1 cock per 3.6 hens, and in the winter of 1951-1952 it was 1 to 3.7."

Wick, William Quentin. THE WINTER MORTALITY AND MOVEMENT OF WILD AND GAME-FARM RING-NECKED PHEASANTS ON ELIZA ISLAND, WASHINGTON. M. S. thesis, Oregon State College. 63 p. 1952.

Wright, Thomas J. A STUDY OF THE PHEASANT BANDING PROGRAM. Rhode Island Department of Agriculture and Conservation, Division of Fish and Game, Pamphlet no. 4. 1-8 p. April 1953.

Although less than 30% of Rhode Island is agricultural land, about 2/3 of the pheasants bagged are wild birds. Roughly 2,000 birds costing over $3.00 each are being released annually. Bands are recovered from an average of 20% of them. Kill of stocked birds is greatest in first week of season; few are recovered in subsequent years. Most released pheasants remain near release site, but a few travel more than 20 miles. It is recommended that no pheasants be stocked at sites from which fewer than 3 bands have been returned.

BIRDS—GROUSE, PARTRIDGE, ETC.

Anonymous. PENNSYLVANIA GREETS WILDLIFE GIFT FROM CANADA. Pennsylvania Game News 24(5): 14-16, illus. May 1953.
Fifty sharp-tailed grouse from Manitoba have been released in large open areas that were created by fire and deer and are unproductive of other game.

Baker, Maurice F. PRAIRIE CHICKENS OF KANSAS. University of Kansas, Museum of Natural History and State Biological Survey, Miscellaneous Publication no. 5. 1-68 p., illus. March 1953.
This attractive bulletin is an important contribution to knowledge of the biology and management of prairie chickens. Data on distribution, particularly in Kansas, are given for both species, but intensive study was devoted to the greater prairie chicken. Subjects treated include: characteristics of habitat; routines and movements of flocks; seasonal activities; reproduction; factors affecting reproduction and increase; details of plumage changes; age and sex recognition; weights; food habits; population changes; changes in age and sex ratios; and management. A prairie chicken area should have at least 1/3 its acreage permanent grassland; 2/3 is better. Moderate grazing is favorable. Cultivated crops are much used. Recommendations are made for: systematic censuses; opening season on upswing of 10-year cycle rather than at peak or on downswing; opening season with pheasant season, to lessen hunting pressure; scattered closed areas; state-owned and managed refuges; pasture management practices that are practical yet benefit chickens. Good range management is good chicken management.

Barnes, Wm. B. PRAIRIE CHICKEN BOOMING GROUNDS IN INDIANA. Indiana Audubon Quarterly 30(1): 7-9. Jan. 1952.
Locations of booming grounds and number of males at each, 1951. Only a few hundred prairie chickens remain in the state. Pastures are favorable habitat. A minimum of about a square mile is necessary to support a flock.

Coats, James Lee. A TRIAL INTRODUCTION OF THE EUROPEAN PARTRIDGE OF DANISH STOCK INTO THE WILLAMETTE VALLEY. Master's thesis, Oregon State College, 1951.

Galbreath, Donald S., and Raleigh Moreland. THE CHUKAR PARTRIDGE IN WASHINGTON. Washington State Game Department, Biological Bulletin no. 11. 1-55 p., illus. Feb. 1953.
The prolific chukar is thriving in rough, dry, rocky areas that formerly supported few game birds. Populations recovered from severe winter kill in only 3 years despite continued hunting. At present it is a problem to get the surplus suitably harvested during the long season permitted. Chukars like overgrazed rangeland, feed heavily on the abundant cheatgrass, conflict scarcely at all with other game species, and require little assistance except the provision of water where this is lacking. The present bulletin provides substantial information on: introductions and their results in Washington and other states; distribution in Washington; physical characteristics; habits; age and sex determination; habitats; seasonal and other travels; reproduction; brood studies; seasonal foods; water needs; compatability with other game birds; status as a game bird; effect of predation and weather; propagation and release; and management.

Hickey, Joseph J., and Robert A. McCabe. SEX AND AGE CLASSES IN THE HUNGARIAN PARTRIDGE. Journal of Wildlife Management 17(1): 90-91. Jan. 1953.
Wisconsin, 1951. Numbers of adult and juvenile males and females shot each week of season; estimated hatching dates. Sex ratio was about even and 77% of birds were juveniles. Most young apparently hatched in late June and early July. Study was made from wings and scapulars.

Janson, Reuel. PRAIRIE CHICKENS IN SOUTH DAKOTA. South Dakota Conservation Digest 20(2): 11, 15-16. Feb. 1953.
Suitable prairie chicken range in the state has been much reduced by cultivation, close grazing, and heavy mowing. Recently abandoned fields or pastures growing up in weeds and grass provide good habitat. Intermittent sloughs and

BIRDS--GROUSE, PARTRIDGE, ETC.--Continued

patches of brush may be used for cover. In Jones County, where the highest prairie chicken population (4 per section) is found, 68% of the land is still in grass and is grazed or mowed only lightly to moderately. Populations seem to fluctuate according to breeding conditions, and hunting seems to have little effect.

Lee, Levon. ESTIMATE STATE'S PRAIRIE CHICKEN POPULATION AT TWELVE TO FIFTEEN THOUSAND. New Mexico Magazine 31(3): 34-35, 42, illus. March 1953.
History, status, and management of lesser prairie chicken in New Mexico. The species probably can persist in the state, but increase will be necessary before hunting can be permitted again, and this depends on adequate rainfall. Drought and overgrazing are extremely unfavorable; they nearly exterminated these grouse in the 1930's. On the other hand, ungrazed refuges became tangles of tall grass that the birds virtually abandoned; perhaps some grazing is beneficial. Protection by cattle ranchers may be the factor that has enabled chickens to survive in New Mexico. Much of the good habitat, however, is gone. The birds are favored by some grain farming, but they occasionally become pests through grain destruction. Nest predation may be serious, and intensive harassement by hawks seems important in winter. A number of chickens are killed by flying into power lines. Water developments were little used.

Ligon, J. Stokley. THE PRAIRIE CHICKEN SURVEY. New Mexico Magazine 31(2): 29. Feb. 1953.
Survey made in New Mexico's best chicken country in November proved that the season could not be opened in 1952. Birds were scarce, probably because exceptionally hot, dry summer weather interfered with production and survival of young. Grain crops, on which chickens depend for winter food, also suffered from the weather. Supplemental winter feeding may be needed. Another dry summer in 1953 may make the situation of the birds critical, as it was in the early 30's.

Peterle, Tony U. THE CANNON PROJECTED NET TRAP FOR CAPTURING SHARPTAILED GROUSE. Presented at 14th Midwest Wildlife Conference, Des Moines, Iowa, Dec. 17-19, 1952. 1-5 p. 1952.
Description, operation, costs. A number of useful modifications of the apparatus are detailed, and some operational problems are discussed.

Zorichak, John L. THE RUFFED GROUSE AS A SNAKE EATER. Flicker 25(1): 2-3, illus. March 1953.
Records of grouse eating garter snakes 14 inches and 19½ inches long. Another record (snake 12 inches) is given on p. 47 of same issue of The Flicker.

BIRDS--TURKEY

Allen, Ralph. THE TURKEY: FINE ALABAMA GAME BIRD. Alabama Conservation 24(5): 16-17, illus. March-April 1953.
By 1940 the turkey population of Alabama was estimated at 11,600. The recent trend toward more pastures and timberland, but fewer farm workers, has been favorable to turkeys and the population is now about 36,000. Turkeys occur in 55 of the state's 67 counties and are still increasing. There are both spring and fall hunting seasons. Bag limits are 1 a day and 5 for the seasons.

Anonymous. 1952-53 WILD TURKEY KILL DROPS 26% BELOW 1951-52 SEASON. Commission of Game and Inland Fisheries, Richmond, Virginia. Press Release for Feb. 18, 1953. 1 p.
With reports in from practically all counties, the turkey harvest in Virginia was only 1600 as compared with 2148 the previous year. Studies to determine the cause of the drop and to remedy the situation are being started.

BIRDS--TURKEY--Continued

Holbrook, Herman L. THE FRANCIS MARION TURKEY PROJECT. Presented at 6th Annual Conference, Southeastern Association of Game and Fish Commissioners, Oct. 19-22, 1952, Savannah, Ga. 1-16 p. [Available from J. H. Jenkins, U. of Ga., Athens.]

Describes management measures successful on refuge portion of Francis Marion National Forest, eastern South Carolina. Burning is important, and 1/3 of refuge is burned each winter, but hardwood stands are spared for mast and browse. Well scattered clearings of 1-12 acres are made by timber sale and bulldozing. Many types of cultivation and planting are used to provide food. Chufas are most important food, but grasses and clovers are well utilized. Handling of plantings is described. Livestock is excluded from refuge, poaching is guarded against, and forestry practices are adapted to turkey needs. Live trapping is being done for transplanting. Live trapping techniques for turkey, deer, and raccoon are described. Deer and raccoon compete with turkey for food to important degree, and raccoons are egg predators. Turkeys and deer have increased greatly on area. Doves and most other small game except quail have also benefited.

Smith, Eldon H. TURKEY TALK. South Dakota Conservation Digest 20(2): 2-5, illus. Feb. 1953.

Review of turkey habits and discussion of status in South Dakota. Twenty-eight turkeys from New Mexico and Colorado were planted in the Black Hills. Though not native there, turkeys have increased to about 1000. A limited season on them is planned.

Smith, Ralph H. THE WILD TURKEY IN NEW YORK. University of the State of New York, Bulletin to the Schools 39(7): 228-231, illus. March 1953.

Turkeys are reappearing along the Pennsylvania border of New York. The reason is thought to be the reversion of hilltops and ridges to forest. This article gives the history of turkeys in New York and outlines the areas and conditions in the state that were favorable for them in early times.

BIRDS--DOVES AND PIGEONS

Barber, Yates M., Jr. AN INTENSIVE DOVE NEST-WATCHING STUDY. [Cover title: Dove nest-watching segment.] North Carolina Wildlife Resources Commission, Final Report PR Project 26-R. 1-34 p. May 1951.

Study was made to see if activities of nesting birds were such that hunting hours in September could be set to avoid shooting of breeding birds. No periodicity favorable to this aim was discovered, but a number of worthwhile observations were made from close study of 3 nests at Raleigh, N. C. Some 170 references are listed.

Colquhoun, M. K. (Abridged from report.) THE WOOD PIGEON IN BRITAIN. London, H.M.S.O., Agricultural Research Council Report Series no. 10. 69 p. 1951. 3 s. [From review by E.M.N., Ibis 94(1).]

Economic and life history study, with comments on techniques in economic ornithology. "After experience of the unsatisfactory nature of volumetric analysis of crop contents measurement by weight was adopted instead, and a representative monthly sample of birds were collected from the Oxford area, their diet being compared with the food locally available and with crop contents from other areas, with observations on feeding habits, and on food consumed by wood pigeons in captivity, and with studies of the crop capacity, rate of digestion, and nutritive requirements."

Dahlgren, Robert B. THE MOURNING DOVE IN UTAH. Utah Fish and Game Bulletin 9(5): 6, 8. May-June 1952.

Brief, preliminary report of 2-year study. Utah had its first dove hunt in fall of 1951. Hunting pressure was light. Doves reached nesting grounds in April and May. Normally there were 2 eggs per nest. Both parents incubated, females taking the night shift, 5 p.m. to 9 a.m. Young were fed grain and weed seeds as well as pigeon milk. Several broods may be reared. July through

BIRDS--DOVES AND PIGEONS--Continued

September nesting success was 58% in 1951. Most loss occurred after hatching. Ground squirrels appeared to be the worst egg predators; house cats caught many young. Most young migrated away in July and August. There was still some breeding when hunting began Sept. 1. Most juveniles bagged were of August hatch. Chief dove foods were grain and certain weed seeds, but snails appeared in 10% of crops.

Drahos, Nick. THE PASSENGER PIGEON. New York State Conservationist 7(5): 11-13, illus. April-May 1953.
Information on the passenger pigeon in New York, based partly on data from old timers. Describes traps, migration, nesting, foods, feeding, slaughter, and gives records of last survivors.

Herman, Carlton M. RECOGNITION OF TRICHOMONIASIS IN DOVES. Bird-Banding 24(1): 11-12. Jan. 1953.
Kinds of birds susceptible, modes of transmission, severity, symptoms, shipment of carcasses for study. "Bird banders concentrating on mourning doves are urged to assist in obtaining quantitative evidence on seasonal incidence of this widespread disease."

Hopkins, Milton N., and Eugene P. Odum. SOME ASPECTS OF THE POPULATION ECOLOGY OF BREEDING MOURNING DOVES IN GEORGIA. Journal of Wildlife Management 17(2): 132-143, maps and graph. April 1953.
Spot mapping of breeding pairs for absolute population measurement was tested on ten 100-acre plots in 1950 and 1951. Recommendations are made for use of this method. Breeding populations varied from 1-9 pairs per 100 acres (av. 3.3 pairs). Four pairs gave a call-count index of 2.6. Most nests were near forest margins, as in tongues of woodland. Breeding pairs are well scattered in Georgia, but there is some tendency toward colonial nesting. Production was very low, 2.1 young per pair, largely because of few nesting attempts per pair. Possible explanations are discussed.

Peters, Harold S. PROGRESS OF THE COOPERATIVE MOURNING DOVE STUDY. Presented at 14th Midwest Wildlife Conference, Des Moines, Iowa, Dec. 17-19, 1952. 1-4 p. 1952.
History, work plans, and cooperation needed. The first phase of the study is being written up, but call counts, random road counts, bag checks, and banding should be continued. Methods for standardized call counts are described. About 80,000 doves have been banded, but recovery rate is only 3%. Nearly 85% of recoveries are within state of banding. Data are given on migration routes in eastern U. S. Table shows state of recovery of 642 doves banded in middle western states.

Schwartz, Charles W., and Elizabeth Reeder Schwartz. BREEDING HABITS OF THE BARRED DOVE IN HAWAII WITH NOTES ON WEIGHTS AND SEX RATIOS. Condor 52(6): 241-246, illus. Nov.-Dec. 1950.
Geopelia striata, a native of Malaya, is now one of the most abundant birds in Hawaii, with populations of 800 per square mile being common. Average adult weight is 55-60 grams, about 2 ounces.

Stewart, Paul A., and James P. Mackey, Jr. A PAIR OF MOURNING DOVES OCCUPIES SAME NEST TWO SUCCESSIVE YEARS. Bird-Banding 24(1): 16. Jan. 1952.

BIRDS--WATERFOWL

Bednarik, Karl. MAGEE MARSH, AN EXPERIMENT THAT WORKED. Ohio Conservation Bulletin 16(2): 10-11, 31-32, illus. Feb. 1952.
Describes the way in which this successful public waterfowl hunting area in Northern Ohio has been operated. Some hunting statistics are given.

BIRDS--WATERFOWL--Continued

Bellrose, Frank C. WATERFOWL REFUGES: ARE THEY OF VALUE? Illinois Wildlife 8(1): 4-5, map. Dec. 1952.

Refuges in Illinois benefit hunters by attracting waterfowl to and keeping them in areas they would otherwise frequent little and leave soon. The benefit to hunters is so marked that duck clubs have set aside portions of their lands on which no shooting is done. Refuges help waterfowl by providing feeding and resting areas on the flyway. Waterfowl resting in refuges forage out for miles, thus utilizing available food far better than they would without refuges. Refuges allow waterfowl to spend more time between breeding and wintering grounds, thus arriving in better condition, and placing less pressure on food resources of wintering grounds. Tables show size, location, and ownership of public refuges in Illinois, and increasing waterfowl use of 3 refuges, 1941-51.

Bellrose, Frank C. HOUSING FOR WOOD DUCKS. Illinois Natural History Survey, Circular 45. 1-47 p., illus. April 1953.

Based on 15 years of research. Discusses home life of the wood duck, breeding habitat, advantages of nest boxes, construction and predator-proofing of board boxes, and construction of new type "predator-proof" sheet metal houses (a valuable contribution to nesting success). In Illinois the most serious nest predators were raccoons, fox squirrels, and bull snakes. Most raccoons could be excluded by an elliptical entrance hole of 3 x 4 inches. Nest boxes received highest wood duck usage when placed about 18 ft. from ground on mature trees in open, upland woods.--Clark G. Webster.

Blake, Charles H. WOOD DUCK DATA NEEDED. Bulletin of the Massachusetts Audubon Society 37(5): 199-200. May 1953.

For sound management of the wood duck under hunting pressure, we need more knowledge of the sex and age structure of numerous local populations, sex and age mortalities, and "changes in the numbers of usable nest sites," and their utilization by the birds. Author recommends cooperation of professionals and volunteers in a program of year-round banding and retrapping, and studies of nesting ecology and natural causes of mortality.--Clark G. Webster.

Breckenridge, Walter J. NIGHT RAFTING OF AMERICAN GOLDEN-EYES ON THE MISSISSIPPI RIVER. Auk 70(2): 201-204, graphs. April 1953.

At Minneapolis, wintering golden-eyes travel many miles each day to spend the night where industrial water warms the stream. Effect of weather and light conditions on this behavior are discussed. Apparently "movements to the raft... are initiated by the light variations at low intensities at and soon after sunset and...the rapidly changing higher light intensities before sunset have no effect on...movements."

Cahoon, Willie G. KILL REPORT FROM LAKE MATTAMUSKEET. Wildlife in North Carolina 17(3): 11. March 1953.

Estimated peak waterfowl populations, by species, 1952; kill, by species, 1950-52. The 1952-53 kill was 4,252 geese and 3,903 ducks, but it is estimated that 15,000 geese were shot just outside the refuge. This kill of geese is thought to be too high. In the first half of the season, at least 80% of geese shot were juveniles.

Cartwright, B. W. STRANGEST MIGRATION PATTERN IN HISTORY ANALYZED. Ducks Unlimited 16(1): 1, 3. Winter [1952-] 1953.

Reasons for poor waterfowl hunting in many states in 1952 season. Reproduction was good in 1952. Many birds hatched early and migrated early--too early to suit hunters. Others remained north until unusually late because expected cold weather did not arrive. Much of the Mid-West was in drought and was avoided by migrants.

Dreis, Robert Edward. PRODUCTIVITY OF THE WOOD DUCK, AIX SPONSA (L.), IN EASTERN LOUISA COUNTY, IOWA, 1951. M. S. thesis, Iowa State College. 1951.

BIRDS--WATERFOWL—Continued

Dushinske, Russ. DRAINAGE VS. DUCKS. North Dakota Outdoors 15(10): 16-17, 19, 23. April 1953.
Reviews many examples of drainage, especially in the northern plains states, and discusses factors and results. Contains little original information but provides a useful compilation of considerable literature, some of which is cited. The necessity of inter-agency land-use planning that will consider the value of wildlife habitat is stressed.

Glover, Fred A. NESTING ECOLOGY OF THE PIED-BILLED GREBE IN NORTHWESTERN IOWA. Wilson Bulletin 65(1): 32-39, illus. March 1953.
Migration, courting, territoriality, nesting, productivity, nest losses, and nesting cover. Control of water level to encourage vegetation and reduce fluctuations of level would favor these grebes.

Hansen, Henry A. MEXICO IS HOSPITABLE TO OUR DUCKS. Washington State Game Bulletin 5(2): 4, 9, map. April 1953.
Based on observations made during annual winter inventory in Jan. 1953. Few ducks are being killed in Mexico and illegal slaughter nearly has been eliminated. Most ducks are in relatively inaccessible areas. The number of ducks wintering in Mexico in 1952-53 was no greater than the number shot in California some years. Crop damage, however, is becoming serious locally. Data are given on the status of various species of ducks in different areas.

Hanson, Harold C. INTER-FAMILY DOMINANCE IN CANADA GEESE. Auk 70(1): 11-16. Jan. 1953.
"It was observed that a peck-order system exists among the Canada Goose families wintering at Horseshoe Lake, Illinois. The limited number of observations available have further indicated that the main factor influencing dominance among Canada Goose families containing different numbers of individuals is simple superiority of numbers."

Hjelle, Brandt V. SPECIES, SEX, AND AGE COMPOSITION OF DUCKS TAKEN BY HUNTERS '52 SEASON. North Dakota Outdoors 15(8): 18. Feb. 1953.
Based on study of 4,093 ducks shot in North Dakota. Fifteen species were represented, but 48.8% of all ducks were mallards. Decline in proportionate kill was noted for gadwall, baldpate, shoveller, and blue winged teal. 52% of all ducks were males. 65% of all males were young of the year. Sex and age ratio figures were similar to those of other years.

Hunt, George S., and Kenneth J. Dahlka. LIVE TRAPPING OF DIVING DUCKS. Journal of Wildlife Management 17(1): 92-95, illus. Jan. 1953.
Construction and operation of a relatively small, simple, wire-mesh trap of the lily-pad type. Wheat is best bait in this trap.

Jordan, James S. CONSUMPTION OF CEREAL GRAINS BY MIGRATORY WATERFOWL. Journal of Wildlife Management 17(2): 120-123. April 1953.
Quantitative data on amount of grain eaten by captive wild mallards, blue-winged teal, and Canada geese. Male mallards ate more than females in fall and winter. Laying females required much food. Food consumption rose in cold weather, and was roughly proportional to body weight. The figures provide a basis for estimating carrying capacity of a food resource.

Leonard, Ross. WATERFOWL IMPROVEMENT AND CONTROL. 41st Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 10-11, 1951, Rochester, N. Y. 108-112 p. 1951.
Reviews habitat loss and damage control problems and some of the measures being taken to counteract them. Remedies should not be left to the federal government. "Part of the job of each state should include the development and restoration of any potential marsh or feeding grounds within its jurisdiction." Private clubs should be given expert advice on managing their waterfowl areas. It is not illegal to shoot over areas that have been planted to duck foods and then flooded; clubs should be encouraged to use such methods, especially where damage control is serious.

BIRDS--WATERFOWL--Continued

Linduska, J. P. FEDERAL-STATE COOPERATION IN THE NATIONAL WATERFOWL PROGRAM. Presented at 14th Midwest Wildlife Conference, Des Moines, Iowa, Dec. 17-19, 1952. 1-7 p. 1952.
Describes new organization of Branch of Game Management of Fish and Wildlife Service, discusses cooperative activities between this branch and flyway committees, and points out some of the problems waterfowl work is facing.

Maebe, J., and H. Van der Vloet. OVER RUE, TREK EN BIOLOGIE DER BERGEEND, TADORNA TADORNA (L.) AAN DE BENEDENSCHELDE. Gerfaut 42(1-2): 59-83, illus. 1952. [From Auk 70(1).]
"Molt follows the usual pattern for surface-feeding ducks. Drakes molt earlier than ducks, and the molt-migration (July) takes the birds to the molting grounds. By October the Sheld-duck is on the winter grounds. The non-breeding population is made up for the most part of adult pairs in small flocks, up to 12 birds, on the feeding grounds. Spring migration is chiefly in February and March. There is much information on the breeding behavior. French and English summaries."

Massachusetts. MASSACHUSETTS WATERFOWL SURVEY. Mass. Department of Conservation, Final Report Project PR-4-R. 1-8 p. + 6 p. of tables and graphs, mimeo. No date. [1952?]
"In the three year period 1949-'51 a waterfowl checking station was operated at Newburyport...Information was gathered on hunting methods and success, composition of the bag, sex and age ratios and weight and bursa depths of the various species with emphasis on the Black Duck which provided an average of 67.4% of the bag." Quantitative data are given on the subjects mentioned as well as on crippling loss and population trends.

McCall, James D. WOOD DUCK BREEDING GROUND SURVEYS IN INDIANA, 1949-1952. Presented at 14th Midwest Wildlife Conference, Des Moines, Iowa, Dec. 17-19, 1952. 1-7 p. + form sheet.
Describes survey methods tried, especially those adopted. Working through marginal vegetation of pothole lakes is worthwhile, but main method used is river surveys via canoe with outboard motor. An average of 0.7 broods per mile, with 7.1 young per brood, has recently been observed on productive routes. Techniques and accuracy of these river surveys are discussed.

McCullough, Robert, and Jessop B. Low. WATERFOWL ACCIDENTALLY CAUGHT IN MUSKRAT TRAPS. Journal of Wildlife Management 17(2): 222. April 1953.
"Thus, in Utah, spring trapping of muskrats where the water is open and ducks are scattered, results in greatly reduced numbers of trapped ducks. In management of the muskrat and waterfowl resource, it would appear wise to prohibit trapping of muskrats until the shallow waters are free of ice."

Mendall, Howard L. MAINE'S NEW CITIZEN--THE RING-NECKED DUCK. Bulletin of the Maine Audubon Society 8(2): 22-25. April 1952.
Increase and spread of this species in the Northeast. It has become an important inland game bird and is a successful breeder. It thrives better than the black duck in bog waters where aquatic plants are scarce.

Mumford, Russell E. THE HOODED MERGANSER IN INDIANA. Indiana Audubon Quarterly 30(1): 2-7, map. Jan. 1952.
Distribution, abundance, and breeding records, with notes on nesting, weights, and foods.

Nice, Margaret Morse. SOME EXPERIMENTS IN IMPRINTING DUCKLINGS. Condor 55(1): 33-37. Jan.-Feb. 1953.
"In 1952, by using Fabricius' simple technique, 12 ducklings of five species were imprinted on human beings as their parent-companions at hatching or shortly after hatching through acoustic signals...and through visual signals..."

Rainey, Dennis. FEEDING OF MALLARDS PREVENTED BY CROWS. Wilson Bulletin 65(1): 41. March 1953.

BIRDS--WATERFOWL--Continued

Rawls, Charles K., Jr. WHY IS A DUCK HUNTER. Tennessee Conservationist 19(5): 7, 11. May 1953.
This popular presentation of waterfowl hunting statistics for Western Tennessee includes the statement that cripple loss is 1 per 1.5 birds bagged. In other words, for every 4 birds bagged about 7 are killed. [This is an exceptionally high estimate. The most recent biennial report of the Michigan Department of Conservation, for example, estimates cripple loss at about 26%.]

Salter, Robert L. BAND RETURNS SHOW WATERFOWL MIGRATION. Idaho Wildlife Review 5(4): 13, map. Jan.-Feb. 1953.
Sources of banded waterfowl shot in Idaho.

Salter, Robert L. HOW MANY DUCKS IN IDAHO? Idaho Wildlife Review 5(5): 3, illus. March-April 1953.
Results of mid-winter inventories, 1951-53.

Schwartz, Charles W., and Elizabeth Reeder Schwartz. NOTES ON THE HAWAIIAN DUCK. Wilson Bulletin 65(1): 18-25, illus. March 1953.
The Koloa or Hawaiian Duck (Anas platyrhynchos wyvilliana) is surviving better than the other 2 Hawaiian anatids, but only about 500 remain, almost all on Kauai. This article discusses past abundance, enemies, habitats, local numbers, foods, breeding habits, condition of certain habitats and destruction of others, and management. Data are given on breeding condition, measurements, and lice of 2 females. One was noteworthy in having large follicles, enlarged oviduct, and a bursa of 22 mm.--characteristics of maturity and immaturity. Recommendations are for protection, habitat improvement, and artificial propagation. These are being undertaken to some extent.

Sieh, James G. THE WATERFOWL STORY IN IOWA. Presented at 14th Midwest Wildlife Conference, Des Moines, Iowa, Dec. 17-19, 1952. 1-15 p. 1952.
Review of waterfowl breeding, migration, and hunting in Iowa, with hunting statistics for 1948-51. There has been a decline in migrants of about 80% in the last decade or two. Only a few species have increased. Few species now nest in the state. Fifty years ago Iowa had approximately 6 million acres of waterfowl nesting habitat--now it has far less than 50,000 acres. Hunting pressure as indicated by duck stamps, has quadrupled since 1935.

Southwick, Charles. A SYSTEM OF AGE CLASSIFICATION FOR FIELD STUDIES OF WATERFOWL BROODS. Journal of Wildlife Management 17(1): 1-8, illus. Jan. 1953.
Proposes use of 5 stages of development based on plumage characters. Weight and age correlations are given. Based on hand reared broods of mallard, pintail, blue-winged teal, shoveller, baldpate, canvasback, redhead, and ring-neck.

Spencer, Howard E., Jr. THE CINNAMON TEAL. Utah Fish and Game Bulletin 9(5): 3, 6. May-June 1952.
Concise, preliminary report of 2-year study in Utah. In certain areas this bird may constitute 20% of the duck population. These teal usually arrive already paired in late March or early April. Hatching peak is in June. Average hatch is about 8 young from perhaps 10 eggs. Serious egg predators on study areas were California gull and common skunk, gulls destroying about a third of the eggs. Distichlis spicata provides preferred nesting cover. Young usually take wing by 7th or 8th week, when broods average 4 or 5. In some plumages these teal look much like blue-wings, but males can be distinguished by orange-red eye. Cinnamon teal migrate early; few are shot after first week of hunting. This teal requires no specialized management measures, benefiting from anything that helps other dabblers.

Wolf, Ken. FLUCTUATING WATER LEVELS AFFECT NESTING WATERFOWL. Utah Fish and Game Bulletin 9(9): 1-2. Oct. 1952.
Review of study made in Utah lakes and reservoirs in 1951. Redheads nested near water's edge, and consequently 90% of their nests were flooded on 1 reservoir. No nest was a total loss, for redheads successfully added to their nests.

BIRDS--WATERFOWL--Continued

Mallards nested on high enough sites that only 39% of their nests were flooded, but 57% of these were completely lost. Mallards more frequently deserted under flooding. "When the water raised 0.16 foot per day for 5 days, 53 per cent of the mallard nests were affected. This same rate of rise produced a 40 per cent loss in the redhead nests which were affected. A rate of rise of 0.29 foot for only three days produced even greater loses and indicated that the ducks were able to cope with an appreciable rise in water level if it were gradual." Coots always successfully added to their nests as levels rose, but then when levels fell the nests toppled, or, if held up by brush, were inaccessible to parents. Nearly 1/3 of the waterfowl population was lost through water damage. Exposed nests did not suffer predation.

Wright, Bruce S. THE RELATION OF BALD EAGLES TO BREEDING DUCKS IN NEW BRUNSWICK. Journal of Wildlife Management 17(1): 55-62. Jan. 1953.
Six years of observation, experiment, and food habits work on the St. John River estuary show that eagles prefer fish and pay little attention to breeding waterfowl. Bands reveal that eagles from much of eastern North America summer here. Most eagles move south in the fall. A few remain and are forced by ice to prey on waterfowl, but this damage is only of local importance. It could be avoided by exposing 1 load of fish wastes for the eagles.

Yancey, Richard K. LEAD POISONING ON CATAHOULA LAKE. Louisiana Conservationist 5(5): 2-5, illus. Feb. 1953.
Thousands of mallards and pintails died early in 1953 from eating lead shot. Water levels are low enough for such an outbreak at Catahoula only once in about 20 years. Suggested control of water level would do no good and would hinder or stop various uses of the lake. The author believes that present fluctuations of water levels are best for all interests.

Yancey, Richard K. THE LOUISIANA WATERFOWL KILL. Louisiana Conservationist 5(7): 7-10, illus. April 1953.
1952 bag is tabulated and discussed by regions of the state. Chief need is more areas open to hunting. The average man, especially along the coast, has no place to hunt waterfowl.

BIRDS--CRANES, RAILS, SHOREBIRDS

Erickson, Arnold B. THE JACKSNIPE. Minnesota Naturalist 3: 39-41. March 1953.
Partly compiled, partly original account of: source of winnowing sound; sex ratio (about 45% males); parasites (apparently none serious); weights (average about 4 ounces); bill lengths (little sex difference); effect of weather on populations (believed slight); nesting habits (brief summary); foods; habitat and hunting in Upper Mid-West; how censuses are made; gradual decline of populations; why snipe have persisted as well as they have despite habitat destruction, drought, and overshooting. Stomachs of 76 birds contained no earthworms. Insects, snails and other animals made up 61% of the diet; duckweed and seeds of rushes and sedges were main vegetable foods. From extreme abundance in the 1870's, snipe slowly were reduced until 1941, when season was closed. They have increased encouragingly in some localities in the last 2 years.

Greeley, Frederick. SEX AND AGE STUDIES IN FALL-SHOT WOODCOCK (PHILOHELA MINOR) FROM SOUTHERN WISCONSIN. Journal of Wildlife Management 17(1): 29-32, illus. Jan. 1953.
Sex can be determined with few errors by width of 3 outer primaries. Absence of bursa in October is indication of adulthood, as is enlarged oviducts. Sex ratio (Wisconsin) was 80 males per 100 females. Age ratio was 1.4 young per adult female. Statistical evidence is given that females are heavier and have longer bills.

Gullion, Gordon W. OBSERVATIONS ON MOLTING OF THE AMERICAN COOT. Condor 55(2): 102-103. March-April 1953.

BIRDS--CRANES, RAILS, SHOREBIRDS--Continued

Ross, C. Chandler. SHORE BIRDS OF THE NEW JERSEY COAST. Cassinia no. 38: 19-30. 1951.
Recent data on status and seasonal occurrence of many species. Shore birds in general are said to be increasing under protection.

Tanner, Ward D. RAIL PRODUCTION IN NORTHWEST IOWA. Presented at 14th Midwest Wildlife Conference, Des Moines, Iowa, Dec. 17-19, 1952. 1-3 p. 1952.
Virginia, king, and sora rails were studied at a public shooting ground in Clay Co., Iowa, in 1951 and 1952. The paper gives data on: time of arrival, relative abundance, numbers and locations of nests, nesting success, causes of nest losses, length of nesting, speed of development, and numbers trapped.

Walkinshaw, Lawrence H. NESTING AND ABUNDANCE OF THE CUBAN SANDHILL CRANE ON THE ISLE OF PINES. Auk 70(1): 1-10, illus. Jan. 1953.

OTHER BIRDS

Allen, Robert P. BIRD COLONIES ALONG THE TEXAS COAST. Audubon Magazine 54(4): 254-259, 270-272, illus. July-Aug. 1952.
Gains and losses of water birds in the period 1939-50 when industrial and recreational expansion in the area was rapid. New spoil banks favored terns and skimmers, so numbers of nests and colonies rose, but 6 other groups of birds declined, some of them alarmingly. Herons, egrets, spoonbills and pelicans face an uncertain future.

Bent, Arthur Cleveland. LIFE HISTORIES OF NORTH AMERICAN WOOD WARBLERS. U. S. National Museum, Bulletin 203. xi + 734 p., illus. 1953. $4.50 from Superintendent of Documents.
This is the latest and largest of the famous series by Bent, a series so well known that little comment is needed. It is enough to say that this volume contains virtually everything known about the natural history and distribution of our wood warblers in 1945, when the manuscript was written. Volumes on the Icteridae, Thraupidae, and Fringillidae will complete the set. It is to be hoped that they will be published without delay.

Cade, Tom J. BEHAVIOR OF A YOUNG GYRFALCON. Wilson Bulletin 65(1): 26-31. March 1953.
Describes and discusses significance of apparently playful attacks on inanimate objects and living animals.

Elliott, John J., and Robert S. Arbib, Jr. ORIGIN AND STATUS OF THE HOUSE FINCH IN THE EASTERN UNITED STATES. Auk 70(1): 31-37. Jan. 1953.
This western bird is now breeding on parts of Long Island and Connecticut as a result of releases in 1940. Its population is about 280. Habitat, behavior, and prospects for the species in the East are discussed.

Fisher, James. THE FULMAR. Collins, 14 St. James's Place, London. xv + 492 p., illus. 1952. 35s. [From review by O. L. Austin, Jr., Bird-Banding 24(1).]
"One of the most detailed, thorough, and authoritative treatises yet to be published on any species, it is a landmark in species monographs." Subjects include ecology, evolution, distribution, history, spread, exploitation, color phases, behavior, life cycle, parasites, predators, and food.

Fisher, James. A HISTORY OF THE FULMAR FULMARUS AND ITS POPULATION PROBLEMS. Ibis 94(2): 334-354. April 1952.
Distribution, spread, populations, enemies, foods, causes of spread, yearly cycle and life cycle. Expanded range and population is attributed to food supplied by wastes from man's fisheries operations. Fulmars do not breed until 7 to 9 years old.

OTHER BIRDS--Continued

Geis, Aelred D. WINTER FOOD HABITS OF A PAIR OF LONG-EARED OWLS. Jack-Pine Warbler 30(3): 93. Sept. 1952.
Based on study of 279 pellets. Chief foods were meadow voles and prairie deer-mice. Only a few small birds were eaten.

Good, Ernest Eugene. THE LIFE HISTORY OF THE AMERICAN CROW CORVUS BRACHYRHYNCHOS BREHM. Ph. D. thesis, Ohio State University. 189 p. 1952.

Jones, J. Knox, Jr. NOTES ON THE FOOD HABITS OF THE GREAT HORNED OWL IN CHERRY COUNTY, NEBRASKA. Nebraska Bird Review 20(1): 10-11. Jan. 1952.
Twenty-three pellets from Valentine Refuge contained remains of 12 Microtus, 8 other small rodents, 1 muskrat, and 2 gallinaceous birds.

Kessel, Brina. DISTRIBUTION AND MIGRATION OF THE EUROPEAN STARLING IN NORTH AMERICA. Condor 55(2): 49-67, maps. March-April 1953.
Discusses breeding range, migration routes, history of range extension, and proportions of populations that migrate. Some birds of all age groups are migratory, others are sedentary. Range extension is largely a result of migrations and wanderings of the young.

Kortlandt, A. A POPULATION STUDY OF THE EUROPEAN CORMORANT IN HOLLAND, BASED ON COUNTING AND BANDING DATA. MS of author's English translation (121 pages of text, 22 photographs, 5 charts) has been filed in the Division of Birds, U. S. National Museum, Washington 25, D. C. The translation can be studied at the National Museum or microfilm copies can be ordered. Original Dutch version was published in Ardea 31, 1942. Some of the author's conclusions were summarized by D. S. Farner in Bird-Banding 17(3).
This paper is important not only because of its information on biology, ecology, behavior, and population dynamics, but because of its statistical treatment of reproduction, population turnover, and mortality in different sex and age groups. The translation was prepared for publication, and since publication plans have not materialized the MS has been deposited where it will be generally available and can receive proper care.

Mayfield, Harold. A CENSUS OF THE KIRTLAND'S WARBLER. Auk 70(1): 17-20. Jan. 1953.
This bird, sometimes called jack pine warbler, is a rare species known to breed only in a small part of Michigan. A 1951 census revealed only 432 males and the total population is thought to be less than 1000. Area occupied measures 64 by 78 miles and lies mainly in the Au Sable drainage. Narrow strips of habitat were not occupied, and few birds were found in otherwise suitable tracts smaller than 80 acres. Where birds occurred, there were about 30 acres per singing male. A territory, however, is but 1 to 4 acres. Tracts of very small jack pines may be used, as may plantings of red and jack pines.

Meanley, Brooke, and Johnson A. Neff. FOOD HABITS OF THE BOBOLINK IN ARKANSAS RICE FIELDS. Auk 70(2): 211-212. April 1953.
Stomach contents of 30 specimens collected in fall of 1951. Rice was chief food, with other grass seeds a poor second.

Olson, Harold. BEETLE ROUT IN THE ROCKIES. Audubon Magazine 55(1): 30-32, illus. Jan.-Feb. 1953.
Woodpeckers of various species have proved important in helping control Engelmann spruce beetles. They have destroyed up to 75% of the beetle population in some areas. Woodpecker populations increase in places of beetle outbreak, with the front of the woodpecker population 1 or 2 years behind that of the beetles. In some infested spots the birds remain scarce for unknown reasons. The author does not maintain that birds alone will stop a major outbreak, but he does believe that they are a very important factor.

OTHER BIRDS--Continued

Pimlott, D. H. THE ECONOMIC STATUS OF THE HERRING GULLS OF THE GRAND MANAN ARCHIPELAGO, NEW BRUNSWICK, 1949. Canadian Wildlife Service, Wildlife Management Bulletin Series 2, no. 5. 1-76 p., illus. 1952.
History of colonies; population estimates; reproduction and juvenile mortality; food habits and feeding behavior; damage to agriculture by taking fish offal used for fertilizer (often important); damage by eating fishes or fish foods (slight); damage to pastures and trees (slight); damage to berry crops (negligible); damage of guano to roofs and boats (slight); predation on eggs and young of other animals (apparently slight locally at time of study); values of gulls as scavengers, producers of eggs for human food, producers of guano, etc. Permitted egg gathering may have helped reduce the population.

Wing, Leonard W. CYCLES IN FLIGHT YEARS OF SNOWY OWL, EVENING GROSBEAK, AND PINE GROSBEAK. Journal of Cycle Research 2(2): 52, graphs. Spring 1953.
"Unless continuous figures are available, such records may not be analyzed by periodic tables or other numerical procedures...The time chart is suggested here as a useful tool for studying rhythm in such records." Snowy owl: "It is likely that in addition to the four-year cycle, other cycles are present. One of about 5.1-years in length seems a possibility." Pine Grosbeak in Lake States: In addition to the four-year cycle, there may be others, one of them slightly over five years. Evening Grosbeak in New England: The two-year timing has been off only in 1916-18, when the birds came three years in a row, but no flight seems to have been reported for 1937.

REPTILES AND AMPHIBIANS

Bartholomew, George A., Jr. THE MODIFICATION BY TEMPERATURE OF THE PHOTOPERIODIC CONTROL OF GONADAL DEVELOPMENT IN THE LIZARD XANTUSIA VIGILIS. Copeia 1953(1): 45-50. Feb. 1953.

Bleakney, Sherman. THE AMPHIBIANS AND REPTILES OF NOVA SCOTIA. Canadian Field-Naturalist 66(5): 125-129. Sept.-Oct. 1952.
List of 21 species, with notes on variation, natural history, and history of the fauna.

Boyles, James H. VARIATION AND DISTRIBUTION OF WATER SNAKES OF THE GENUS NATRIX IN ALABAMA. Master's thesis, University of Alabama, 1952.
Eleven species and subspecies of the genus Natrix found in Alabama, were studied on the basis of distribution, variation and ecological preferences. Data on intrapopulation variation, and subspecific intergradation are presented, along with conclusions on the clinal variation in the genus in the state.--R. L. Chermock.

Carpenter, Charles C. A STUDY OF HIBERNACULA AND HIBERNATING ASSOCIATIONS OF SNAKES AND AMPHIBIANS IN MICHIGAN. Ecology 34(1): 74-80. Jan. 1953.
Hibernation sites in ant mound, meadow vole tunnel, and crayfish burrow are described. Snakes and amphibians may hibernate in the same quarters. Snakes may hibernate beneath water, and while hibernating, may be preyed upon by crayfish. Temperatures of hibernating snakes are higher than those of surrounding soil.

Carpenter, Charles C. TRAPPING TECHNIQUE FOR AQUATIC SALAMANDERS. Herpetologica 8(4): 183. Jan. 1953.
Small funnel traps placed in water along bank. No bait used.

Chermock, Ralph L. A KEY TO THE AMPHIBIANS AND REPTILES OF ALABAMA. Geological Survey of Alabama (University, Alabama), Museum Paper 33. 1-88 p., illus. 1952.
Semitechnical keys to all groups, including subspecies, and to eggs and tadpoles of frogs. Characters are explained by glossary and illustrations. A map shows natural areas of the state referred to in the brief statements of range in state; general range is not mentioned. Short introductory sections discuss collection and preservation of specimens and treatment of snake bite. The paper is based on much field and museum work.

REPTILES AND AMPHIBIANS--Continued

Dessauer, Herbert C. HIBERNATION OF THE LIZARD, ANOLIS CAROLINENSIS. Proceedings of the Society for Experimental Biology and Medicine 82(2): 351-353. Feb. 1953.
Biochemical study of changes in glucose, glycogen, and lipid storage during the year. "Neither varying...light...nor...constant temperature had any marked effect on the constituents analyzed."

Jutzy, D. A., S. H. Biber, N. W. Elton, and E. C. Lowry. A CLINICAL AND PATHOLOGICAL ANALYSIS OF SNAKE BITES ON THE PANAMA CANAL ZONE. American Journal of Tropical Medicine and Hygiene 2(1): 129-141. Jan. 1953.
Findings in 55 cases, mostly of Bothrops bites. Incidence of bites was low but mortality was about 30%. Treatment is discussed.

Lowe, Charles H., Jr., and Richard G. Zweifel. A NEW SPECIES OF WHIPTAILED LIZARD (GENUS CNEMIDOPHORUS) FROM NEW MEXICO. Bulletin of the Chicago Academy of Sciences 9(13): 229-247, illus. Oct. 1952.
C. neomexicanus: description, comparisons, ecology.

Martof, Bernard S. TERRITORIALITY IN THE GREEN FROG, RANA CLAMITANS. Ecology 34(1): 165-174, illus. Jan. 1953.
Females summer along streams, staying at breeding pond about a week. Most adult males spend summer at breeding ponds. They are spaced with surprising uniformity about 2-3 meters apart. Breeding males maintain their positions in their groups for about two months, although the groups may move from pond to pond. Breeding season is long, and during it "a small proportion of the activity range is maintained as a primitive type of territory."

Moore, Joseph C. THE CROCODILE IN THE EVERGLADES NATIONAL PARK. Copeia 1953(1): 54-59, map. Feb. 1953.
Summary of recent records (map), habitat, nesting habits, dates of egg laying by captives, sizes of eggs and young. Crocodiles in the U. S. are virtually restricted to salt water of Florida Bay. Their extermination was feared until recently, when National Park protection was extended to Florida Bay and commercial fishing was regulated. There has not yet been time for increase to appear.

Penny, J. T. DISTRIBUTION AND BIBLIOGRAPHY OF THE AMPHIBIANS AND REPTILES OF SOUTH CAROLINA. University of South Carolina Publications (Columbia, S. C.), Biology, Series III, 1(1): 3-28. Nov. 1952. [From American Naturalist 87(833).]

Stahnke, Herbert L. THE L-C TREATMENT OF VENOMOUS BITES OR STINGS. American Journal of Tropical Medicine and Hygiene 2(1): 142-143. Jan. 1953.
Proposed method of treating snake bite, scorpion stings, etc. "L-C" stands for ligature and cryotherapy. A tight tourniquet is placed just above bite and the bitten part is submerged in ice water or covered with large ice pack. Ligature is removed in 5 minutes after use of cold is begun. Ethyl chloride, carefully used to avoid freezing body, may be substituted for ice. The idea of the L-C approach is to cause venom to enter system so slowly little harm is done. [The method can and should be used with antivenin, but even so the method cannot be recommended for general use without extensive tests not reported here.]

Vernberg, F. John. HIBERNATION STUDIES OF TWO SPECIES OF SALAMANDERS, PLETHODON CINEREUS CINEREUS AND EURYCEA BISLINEATA BISLINEATA. Ecology 34(1): 55-62, graph. Jan. 1953.
Mortality, depth of hibernation, vertical movements, hibernating chambers, effect of temperature and moisture, moisture loss.

Waters, John. TURTLE HUNTING WITH A CHAMP. Ohio Conservation Bulletin 17(4): 10-11, 30-31, illus. April 1953.
Gives many details of the technique of catching snapping turtles on baited hook

REPTILES AND AMPHIBIANS--Continued

Wood, John Thornton. OBSERVATIONS ON THE COMPLEMENTS OF OVA AND NESTING OF THE FOUR-TOED SALAMANDER IN VIRGINIA. American Naturalist 87(833): 77-86, graphs. March-April 1953.

Wood, John Thornton. THE NESTING OF THE TWO-LINED SALAMANDER, EURYCEA BISLINEATA, ON THE VIRGINIA COASTAL PLAIN. Chicago Academy of Sciences, Natural History Miscellanea no. 122. 1-7 p., illus. April 1953.

Woodin, William H. NOTES ON SOME REPTILES FROM THE HUACHUCA AREA OF SOUTHEASTERN ARIZONA. Bulletin of the Chicago Academy of Sciences 9(15): 285-296. Feb. 1953.
Annotated list. Data on habits and distribution of Arizona coralsnake are especially valuable, perhaps the major contribution to our knowledge of this snake. Interesting facts are also given for a number of other species.

FISHES

Fowler, Henry W. A LIST OF THE FISHES OF NEW JERSEY, WITH OFF-SHORE SPECIES. Proceedings of the Academy of Natural Sciences of Philadelphia 104: 89-151, illus. Oct. 1952.
Lists fresh and salt water species with distributional records for state. Bibliography supplements that of author's 1920 list.

Freeman, H. W. FISHES OF RICHLAND COUNTY, SOUTH CAROLINA. University of South Carolina Publications (Columbia, S. C.), Biology, Series III, 1(1): 28-41. Nov. 1952. [From American Naturalist 87(833).]

Jurgens, Kenneth C., and Clark Hubbs. A CHECKLIST OF TEXAS FRESH-WATER FISHES. Texas Game and Fish 11(4): 12-15. March 1953.
Scientific list of 197 species. Includes common names.

Keefe, Ruth V. PARTIAL LIST OF FISHERY PERIODICALS. U. S. Fish & Wildlife Service, Fishery Leaflet 160. 9 p. Revised Dec. 1952.

Moore, George A. A LIST OF THE FISHES OF OKLAHOMA [Cover title: Fishes of Oklahoma]. State Game and Fish Department, Oklahoma City. 12 unnumbered p., illus. 1952.
Good check list giving common and scientific names. 15 drawings of common species.

Roedel, Phil M. OFFICIAL COMMON NAMES OF CERTAIN MARINE FISHES OF CALIFORNIA. California Fish and Game 39(2): 251-262. April 1953.
Revised list of standardized common names for some 280 species, including those of commercial or sporting importance.

Rounsefell, George A., and W. Harry Everhart. FISHERY SCIENCE: ITS METHOD AND APPLICATIONS. John Wiley & Sons, N. Y. xii + 444, illus. May 1953. $7.50.
The authors have pooled their backgrounds to produce a book that treats both marine and freshwater fishery management. Methodology and equipment are emphasized, with life histories, pathology and similar material receiving only incidental attention. It is of real value to have so many methods of obtaining and analyzing data presented in one volume. The authors tell how to estimate population size, and how to determine weight-length relationships, mortality rates, relative abundance, availability, growth, age, and coefficient of condition. Numerous examples show the statistical or arithmetical steps involved. The book contains long sections describing fishways, screens and racks, types of tags, and fishing gear. It should be a useful reference, and should serve well as the text of a course in fisheries techniques.--John T. Linehan.

INVERTEBRATES

Fitch, John E. COMMON MARINE BIVALVES OF CALIFORNIA. California Department of Fish and Game, Fish Bulletin no. 90. 1-102 p., illus. 1953.
Treats 60 edible species. Has key to and photographs of each species. Introductory sections discuss biology and use of bivalves. The following information is given for each species: description, range, habits, use, common names.

Friauf, James J. AN ECOLOGICAL STUDY OF THE DERMAPTERA AND ORTHOPTERA OF THE WELAKA AREA IN NORTHERN FLORIDA. Ecological Monographs 23(2): 70-126, illus. April 1953.

Middlekauff, W. W. THE HORSE FLIES AND DEER FLIES OF CALIFORNIA. University of California Press, Bulletin of the California Insect Survey 1(1): 1-24, illus. June 1950. 35¢.
Keys, distributional records, and 1 plate illustrating terminology.

Muesebeck, C. F. W., K. V. Krombein, H. K. Townes, and others. HYMENOPTERA OF AMERICA NORTH OF MEXICO--SYNOPTIC CATALOG. U. S. Department of Agriculture, Agriculture Monograph no. 2. 1-1420 p., map. April 1951. $4.00 from Superintendent of Documents.
Authoritative reference that lists all species and higher groups. Includes synonymies and brief range statements.

VEGETATION--GENERAL, ECOLOGY, CONTROL, TECHNIQUES

Martin, S. Clark. APPARENT KILL OF PERSIMMON AND SASSAFRAS BY APPLICATION OF 2,4-D AND 2,4,5-T. U. S. Forest Service, Central States Forest Experiment Station (Columbus 15, Ohio), Technical Paper no. 132. 1-8 p., illus. Dec. 1952.

Muzik, T. J., G. W. Luvisi, and H. J. Cruzado. A METHOD FOR STATISTICAL EVALUATION OF NEW HERBICIDES. Agron. Jour. 44: 91-92. Feb. 1952. [From Journal of Range Management 5(4).]

Peterson, Roald A. COMPARATIVE EFFECT OF SEED TREATMENTS UPON SEEDLING EMERGENCE IN SEVEN BROWSE SPECIES. U. S. Forest Service, Northern Rocky Mountain Forest and Range Experiment Station (Missoula, Mont.), Research Note no. 114. 1-11 p., graphs. Jan. 1953.
Experiments on and recommendations for treatment of seeds of antelope bitterbrush, redosier dogwood, redstem ceanothus, snowbrush ceanothus, western chokecherry, Rocky Mountain maple, and Saskatoon serviceberry.

Porsild, A. E. EDIBLE PLANTS OF THE ARCTIC. Arctic 6(1): 15-34, illus. March 1953.
Includes information on preparation and use.

Pound, Charles E., and Frank E. Egler. BRUSH CONTROL IN SOUTHEASTERN NEW YORK: FIFTEEN YEARS OF STABLE TREE-LESS COMMUNITIES. Ecology 34(1): 63-73. Jan. 1953.
In 1934-36 a fire line through forest land was cleared and harrowed by the CCC. Part of the line has been invaded by trees, but part has been occupied by a dense, low brush cover. Plant communities of the brush types were studied in detail. They include few trees, and these trees show little sign of success; trees are repeatedly cut back by animals and matted down by falling vegetation. The results are of interest in showing that desired brush associations on fire lines, power line clearings and similar sites sometimes can be maintained for many years with a minimum of effort.

Robbins, W. W., A. S. Crafts, and R. N. Raynor. WEED CONTROL: A TEXTBOOK AND MANUAL. 2nd. ed. McGraw-Hill, N. Y. xi + 503 p., illus. 1952.

VEGETATION--FLORAS AND COMMUNITIES

Conard, Henry S. THE VEGETATION OF IOWA; AN APPROACH TOWARD A PHYTOSOCIOLOGIC ACCOUNT. State University of Iowa Studies in Natural History 19(4): 1-66, illus. 1952. $1.00.

An inspiring, informative picture that has excellent historical and geographical perspective. Separate chapters describe general conditions, vegetational change, the classification of communities, and eight different classes of communities (woodlands, shrublands, grasslands, aquatic communities, communities of rocks and cliffs, communities of epiphytes, communities of springs and seeps and communities of cultivated plants). Maps of the state showing drainage basins, glacial drifts and soil materials and original forests, other maps, diagrams, plant lists, and the integrated observations of many other botanists help one's understanding of the picture. Long bibliography.--Neil Hotchkiss.

Gleason, Henry A. THE NEW BRITTON AND BROWN ILLUSTRATED FLORA OF THE NORTHEASTERN UNITED STATES AND ADJACENT CANADA. 3 vols. New York Botanical Garden. lxxv + 482 + 655 + 589 p., illus. 1952. $27.50 before July 1, 1953, $30.50 thereafter.

Clearer descriptions, much better drawings, and up-to-date taxonomy and nomenclature make this much more useful for the identification of ferns and flowering plants than was the 2nd edition of Britton and Brown, published in 1913. The present flora covers the territory from the Gulf of St. Lawrence, the 47° parallel in southern Quebec and Ontario, and the north boundary of Minnesota west of Lake of the Woods, south through Virginia, Kentucky, and Missouri, and west through Missouri, Iowa, and Minnesota. The 2nd edition of Britton and Brown covered additional territory to the north and west. The 8th edition of Gray's Manual, published in 1950 (see WR 61:43) includes the territory of the present flora and extends north through Newfoundland and to the 49° parallel in Quebec and Ontario.--Neil Hotchkiss.

Hanson, Herbert C. VEGETATION TYPES IN NORTHWESTERN ALASKA AND COMPARISONS WITH COMMUNITIES IN OTHER ARCTIC REGIONS. Ecology 34(1): 111-140, illus. Jan. 1953.

The bulk of the paper is devoted to descriptions of plant communities recognized by the author. "This classification [of vegetation types] has been found useful in making aerial surveys of lichen range suitable for grazing during the winter by reindeer. The various types are valuable in indicating soil conditions such as depth to perennial frost, kind of surface and subsurface materials, and moisture and drainage conditions. As a result, the classification is of value when surveys are made for locating roadways, camp sites, landing fields, etc." "Suitable conditions for good growth of lichens, furnishing winter pasturage for reindeer, occur in many of these types...The lichens have, however, been depleted over large areas by overgrazing and fire."

Kibbe, Alice L. A BOTANICAL STUDY AND SURVEY OF A TYPICAL MID-WESTERN COUNTY (HANCOCK COUNTY, ILLINOIS), COVERING A PERIOD OF 119 YEARS, FROM 1833 TO 1952. Author, Carthage College, Carthage, Ill. 425 p. 1952.

Hancock County is along the Mississippi River where Iowa, Missouri, and Illinois meet. Because of the continued explorations of botanists over such a long period, including those of the author for the final 30 years, the account of changes in the flora and vegetation are particularly interesting and valuable.--Neil Hotchkiss.

Niering, William A. THE PAST AND PRESENT VEGETATION OF HIGH POINT STATE PARK, NEW JERSEY. Ecological Monographs 23(2): 127-148, illus. April 1953.

Describes history, successions, and major and minor communities of this area in which chestnut oak (Q. prinus) is now the chief dominant.

VEGETATION--FLORAS AND COMMUNITIES--Continued

Strausbaugh, P. D., and Earl L. Core. FLORA OF WEST VIRGINIA (PART I). West Virginia University Bulletin Series 52, no. 12-2. 273 p., illus. June 1952. $1.00 from West Virginia University Bookstore, Morgantown, W. Va.
This volume describes ferns, conifers, and monocots. Keys, brief descriptions, and drawings make it a complete handbook for identification. Drawings are grouped on alternating pages, and species they illustrate usually are described on facing pages.--Neil Hotchkiss.

Tiffany, Lewis Hanford, and Max Edwin Britton. THE ALGAE OF ILLINOIS. University of Illinois Press, 5750 Ellis Avenue, Chicago 37, Ill. 407 p., 1186 figs. 1952. $10.00. [From review in A.I.B.S. Bulletin 3(2).]
Well illustrated handbook with keys to all groups. "Each taxonomic category is discussed clearly and concisely with respect to structure, reproduction, pigmentation, and food synthesis."

Wade, Wilbert Ernest. A STUDY OF THE TAXONOMY AND ECOLOGY OF MICHIGAN DESMIDS. Ph. D. thesis, Michigan State College. 623 p. 1952. [From long abstract in Dissertation Abstracts 12(6).]

VEGETATION--FOREST

Anonymous. TREES OF MINNESOTA, HOW TO KNOW THEM: A POCKET MANUAL. 4th edition. Department of Conservation, St. Paul. 64 p., illus. 1952. [From Journal of Forestry 51(3).]

Arnold, Joseph F. EFFECT OF HEAVY SELECTION LOGGING ON THE HERBACEOUS VEGETATION IN A PONDEROSA PINE FOREST IN NORTHERN ARIZONA. Journal of Forestry 51(2): 101-105, illus. Feb. 1953.

Baker, Harold L., and Adon Poli. AREA AND OWNERSHIP OF FOREST LAND IN HUMBOLDT COUNTY, CALIFORNIA. U. S. Forest Service, California Forest and Range Experiment Station (Berkeley, Calif.), Forest Survey Release no. 16. 1-23 p., illus. Nov. 1952.
Includes discussion and map of forest types.

Baker, Harold L., and Adon Poli. AREA AND OWNERSHIP OF FOREST LAND IN DEL NORTE COUNTY, CALIFORNIA. U. S. Forest Service, California Forest and Range Experiment Station (Berkeley), Forest Survey Release no. 18. 1-23 p., illus. Jan. 1953.

Conservation Foundation. FORESTS FOR THE FUTURE. American Forests 58(12, pt. 2): 1-36, illus. Dec. 1952.
Opinions on and analysis of the outstanding forest resource problems: drain, growth, and supply; problem of small holdings; regulation of private forest practices. Summaries of opinions of U. S. Forest Service, industry, and L. H. Gulick are followed by discussions and conclusions of the Foundation. Many tables and graphs are presented. No clear conclusion on growth vs. drain is reached. Many large private forests are well operated, but 64% of private forest lands are subjected to poor cutting practices. Federal control of private operations is not recommended. Economic factors are coming to favor better woodlot management. It is felt that education and some local control (especially of loggers and millers) constitute the best approach.

Deitschman, Glenn H., and Richard D. Lane. FOREST PLANTING POSSIBILITIES ON INDIANA COAL-STRIPPED LANDS. U. S. Forest Service, Central States Forest Experiment Station (Columbus 15, Ohio), Technical Paper no. 131. 1-57 p., illus. Dec. 1952.
Many stripped lands in Indiana now are or can be good for timber production, fishing, parks, or agriculture. The present paper provides background material, reports on voluntary or experimental timber stands, and makes recommendations for future planting and management.

VEGETATION--FOREST--Continued

Elliott, Jack Calkins. THE PHYTOSOCIOLOGY OF THE UPLAND SECOND GROWTH HARDWOODS OF MISSAUKEE COUNTY, MICHIGAN. Ph. D. thesis, Michigan State College. 286 p. 1952. [From long abstract in Dissertation Abstracts 13(1).]

Forest Survey Organization. FOREST STATISTICS OF CENTRAL AND NORTHERN INDIANA. U. S. Forest Service, Central States Forest Experiment Station (Columbus 15, Ohio), Forest Survey Release no. 14. 1-29 p., map. Dec. 1952.

Forest Survey Staff. FOREST STATISTICS FOR THE REDWOOD-DOUGLAS-FIR SUB-REGION IN CALIFORNIA. U. S. Forest Service, California Forest and Range Experiment Station (Berkeley), Forest Survey Release no. 19. 1-54 p., illus. Jan. 1953.

Hutchison, S. Blair, and Paul D. Kemp. FOREST RESOURCES OF MONTANA. U. S. Department of Agriculture, Forest Resource Report no. 5. iii + 76 p., illus. 1952. 55¢ from Superintendent of Documents.
All aspects of the situation are discussed. In general, greater utilization and more intensive management are desirable. More access roads are especially needed. A large colored map shows distribution and extent of forest types.

Keever, Catherine. PRESENT COMPOSITION OF SOME STANDS OF THE FORMER OAK-CHESTNUT FOREST IN THE SOUTHERN BLUE RIDGE MOUNTAINS. Ecology 34(1): 44-54. Jan. 1953.
Future dominants will be oaks of several species and hickories.

King, D. B., and R. K. Winters. FOREST RESOURCES AND INDUSTRIES OF ILLINOIS. University of Illinois Agricultural Experiment Station (Urbana), Bulletin 562. 1-95 p., illus. Dec. 1952.
An unusually readable and attractive report. It presents the forestry situation from all angles, with statistics and recommendations, but it also gives a considerable amount of readily grasped information on the nature of the state and its major regions. Much of the forest land in the state is grazed or otherwise misused, but nevertheless the volume of timber in Illinois is increasing. More land in the southern part of the state is constantly reverting to woodland.

Knedell, Charles F. SNOW CONDITIONS IN SHELTERBELTS. North Dakota Outdoors 15(8): 13-15, graphs. Feb. 1953.
Reports snow profiles of various shelterbelts, North Dakota, 1951-52.

Larson, Robert W. THE TIMBER SUPPLY SITUATION IN FLORIDA. U. S. Department of Agriculture, Forest Resource Report no. 6. iii + 60 p., illus. 1952. 70¢ from Superintendent of Documents.
A well rounded survey of the situation and what needs to be done about it. Florida's forest land could produce 2½ times as much timber if adequately stocked and properly managed. Large colored map shows distribution of forest types.

Moravets, F. L. FOREST STATISTICS FOR SKAMANIA COUNTY, WASHINGTON. U. S. Forest Service, Pacific Northwest Forest and Range Experiment Station (Portland, Ore.), Forest Survey Report no. 107. ii + 23 p., illus. Jan. 1953.

Moravets, F. L. FOREST STATISTICS FOR CLARK COUNTY, WASHINGTON. U. S. Forest Service, Pacific Northwest Forest and Range Experiment Station (Portland, Ore.), Forest Survey Report no. 108. ii + 25 p., map. April 1953.

Olmstead, R. L. WOODLAND PASTURE COSTS YOU MONEY. Michigan Conservation 22(3): 28-30, illus. May-June 1953.
Facts and figures show that grazing of woodlots is bad for production of livestock, timber, and game.

VEGETATION--FOREST--Continued

Peters, George H. THE TREES OF LONG ISLAND. Long Island Horticultural Society, Farmingdale, L. I., N. Y. 63 p., illus. 1952. $1.00. [From review by J. J. Levison, Journal of Forestry 51(5).]
Discusses the 68 native species and the factors that affect their distribution. Lists largest trees and their location on L. I. Tells of the many introduced trees, and gives histories of various individual trees.

Read, Ralph A. WOODLAND FORAGE IN THE ARKANSAS OZARKS. Journal of Range Management 4(6): 391-396, illus. Nov. 1951.
Quantitative study of forage production in different types of stands. Burning and promiscuous grazing are now the rule. Sites good for timber should be protected from grazing and burning. The poorest forest sites should (if possible) be converted to perennial grass pasture. Areas of intermingled type should have light enough grazing to protect tree production.

Rotty, Roland. FOREST AND SHELTERBELT PLANTING IN THE UNITED STATES DURING 1952. Journal of Forestry 51(5): 356-358. May 1953.
Shows acreage planted in each state in 1952, in previous years, and in total, and how much of the acreage was federal, other public, or private land. Most increases were in the South. National total was 522,935 acres, slightly more than in the previous record year of 1940.

Shepherd, W. O. EFFECTS OF BURNING AND GRAZING FLATWOODS FOREST RANGES. U. S. Forest Service, Southeastern Forest Experiment Station (Asheville, N. C.), Research Notes, no. 30. 1-2 p., graphs. May 1953.
Effects of different burning schedules in the longleaf, slash pine region of Georgia. Burning greatly improved spring forage values and cattle weight gain. Practically all understory species tolerated winter burning. Burning and grazing together markedly decreased 2 valuable grasses, but increased other forage plants. Without burning, herbs decreased and brush increased, whether grazed or not. Grazing did not affect tree stands detectably. Burning did not permit establishment of slash pine seedlings. Data are also presented on diminution of forage with increase of canopies, and on accumulation of fuel from herbaceous vegetation. For complete report see Georgia Coastal Plain Bulletin no. 51, obtainable from Georgia Coastal Plain Experiment Station, Tifton, Ga., or from Southeastern Forest Experiment Station.

Southern Forest Survey. FOREST STATISTICS FOR ARKANSAS. U. S. Forest Service, Southern Forest Experiment Station (New Orleans, La.), Forest Survey Release 71. 1-50 p., maps and graphs. March 1953.

Sterling, Dorothy, and Myron Ehrenberg. TREES AND THEIR STORY. Doubleday and Co., Garden City, N. Y. 1-119 p., illus. 1953. $2.50.
An attractive book for young people. The many black and white photographs occupy more than half the space. Functions of roots, trunk, leaves, buds, flowers, fruit and bark are told in simple fashion, and the many pictures of these structures as well as those of leaf scars and tree form provide an introduction to identification. One chapter treats the conservation and values of trees.

Winters, R. K. and others. FOREST STATISTICS OF INDIANA. U. S. Forest Service, Central States Forest Experiment Station (Columbus 15, Ohio), Forest Survey Release no. 15. 1-36 p., maps and graphs. Jan. 1953.

Woodruff, N. P., and A. W. Zingg. WIND TUNNEL STUDIES OF SHELTERBELT MODELS. Journal of Forestry 51(3): 173-178, illus. March 1953.
"The different shelterbelts are ranked according to their effectiveness in reducing the velocity at the ground surface and at elevations above the surface. A 10-row shelterbelt of conventional design was found to be the most effective at both levels. The alternate designs of 10-row belts were less effective or were variable in their effectiveness, with some designs showing relatively more effectiveness at higher elevations than at the surface. The 5- and 7-row shelterbelts were found to offer nearly as much protection as the 10-row designs."

VEGETATION--FOREST--Continued

Wray, Robert D., and Wayne G. Banks. FOREST STATISTICS FOR WESTERN MARYLAND. U. S. Forest Service, Northeastern Forest Experiment Station (Upper Darby, Pa.), Forest Statistics Series: Maryland no. 1. ii + 20 p., map. June 1952.

Zasada, Zigmond A. REPRODUCTION ON CUT-OVER SWAMPLANDS IN THE UPPER PENINSULA OF MICHIGAN. U. S. Forest Service, Lake States Forest Experiment Station (University Farm, St. Paul 1, Minn.), Station Paper no. 27. 1-15 p. Dec. 1952.
New stands are becoming established, but on all soil types they contain a larger proportion of hardwoods. The proportion of white cedar has dropped, and reproduction of black spruce is low. Balsam fir is increasing in importance on all soil types. Aspen is invading swamps only on wet mineral soils. In general, coniferous reproduction is better on partially cut than on clear-cut areas.

Zink, Robert C. (Carl E. Jepson, editor). TREES AND SHRUBS OF GRAND TETON NATIONAL PARK. Jackson Hole Museum Association, Museum Bulletin no. 2. 104 p., illus. 1952. 60¢ from Naturalist, Grand Teton National Park, Moose, Wyo. [From review in National Parks Magazine 27(113).]
Guide for beginners, with keys to groups, descriptions, statements of usefulness and range, and illustrations for each species.

VEGETATION--PASTURE AND RANGE

Albertson, F. W., Andrew Riegel, and John L. Launchbaugh, Jr. EFFECTS OF DIFFERENT INTENSITIES OF CLIPPING ON SHORT GRASSES IN WEST-CENTRAL KANSAS. Ecology 34(1): 1-20, illus. Jan. 1953.

Blaisdell, James P., A. C. Wiese, and C. W. Hodgson. VARIATIONS IN CHEMICAL COMPOSITION OF BLUEBUNCH WHEATGRASS, ARROWLEAF BALSAMROOT, AND ASSOCIATED RANGE PLANTS. Journal of Range Management 5(5): 346-353. Sept. 1952.
"This paper describes seasonal variations of wheatgrass and balsamroot over a 4-year period and includes similar information on some associated species: Sandberg bluegrass (Poa secunda), hawksbeard (Crepis acuminata), threetip sagebrush (Artemisia tripartita), and bitterbrush (Purshia tridentata)." Idaho.

Commonwealth Bureau of Pastures and Field Crops. HERBAGE ABSTRACTS. Commonwealth Agricultural Bureaux, Central Sales Branch, Farnham Royal, Bucks., England. £6.30 per year, including author and subject indexes. One-sided copies, from which abstracts can be cut for pasting on cards, supplied at $7.70 per volume.
This quarterly journal provides abstracts from the world's current literature on grassland husbandry and fodder-crop production, both temperate and tropical. Annual indexes date from 1930. Should be of great value to all concerned with range or pasture management.

Cooper, Harold W. AMOUNTS OF BIG SAGEBRUSH IN PLANT COMMUNITIES NEAR TENSLEEP, WYOMING, AS AFFECTED BY GRAZING TREATMENT. Ecology 34(1): 186-189, illus. Jan. 1953.
On the area studied, big sagebrush is a dominant in a disclimax that is largely the result of past grazing practices. Amounts of big sagebrush in excess of 10% of total coverage indicate ecological degeneration. When conservative grazing and occasional resting of pastures is practiced on this site, climax grasses can largely replace big sagebrush without artificial aid. Under favorable weather and grazing conditions, climax grasses can displace big sagebrush within a decade or less.

Jameson, Donald A. NUTRITIVE VALUE OF BROWSE ON MONTANA WINTER RANGES. Journal of Range Management 5(5): 306-310, illus. Sept. 1952.
Based on studies of cattle but should have wildlife significance. Author's conclusions: "Winterfat, greasewood, and shadscale were important as winter feed sources on the study pastures, whereas big sagebrush has very little use. Abundant, palatable browse plants on winter ranges should provide some nutrients

VEGETATION--PASTURE AND RANGE--Continued

which are deficient in range grasses during the winter months. On this experimental area, the palatable shrubs had some value as sources of protein and carotene, but were not valuable as a phosphorus source."

Nelson, N. Talmadge. RANGE MANAGEMENT IN ALASKA. Our Public Lands 2: 15, 18. Jan. 1952. [From Journal of Range Management 5(4).]

Parker, Kenneth W., and S. Clark Martin. THE MESQUITE PROBLEM ON SOUTHERN ARIZONA RANGES. U. S. Department of Agriculture, Circular 908. i + 70 p., illus. Oct. 1952.

Robocker, W. C., J. T. Curtis, and H. L. Ahlgren. SOME FACTORS AFFECTING EMERGENCE AND ESTABLISHMENT OF NATIVE GRASS SEEDLINGS IN WISCONSIN. Ecology 34(1): 194-199, illus. Jan. 1953.

Semple, A. T. IMPROVING THE WORLD'S GRASSLANDS. FAO Agricultural Studies no. 16. Printed in Great Britain at University Press, Aberdeen. xiii + 147 p., illus. 1951. 10s. (Food and Agriculture Organization of the United Nations, Rome, Italy.) [From review by H. W. Springfield, Journal of Range Management 5(5).]

"...authoritative and full of factual information...The author had the help of some seventy-seven...experts the world over...The material presented is organized under the following chapter headings: 1. The importance of grasslands. 2. The place of grass in agriculture. 3. Rangeland improvement. 4. Livestock management. 5. Seeding and fertilizing. 6. Some examples of mechanical treatment and burning. 7. National programmes of grassland improvement. 8. Fodder from trees and shrubs. 9. Supplemental feeding. 10. The need for research."

VEGETATION--WET-LAND

Barber, Yates M., Jr. EXPERIMENTAL CONTROL OF JUNCUS ROEMARIANUS WITH HERBICIDES IN NORTH CAROLINA. Presented at 6th Annual Conference, Southeastern Association of Game and Fish Commissioners, Oct. 19-22, 1952, Savannah, Ga. 1-6 p. [Available from J. H. Jenkins, U. of Ga., Athens.]

Results of tests of 11 herbicides or combinations. Only isopropyl ester of 2,4-D was effective, and this at rate of 27 lbs. acid equivalent per acre. Treatment at flowering time was best. Cost of large scale application would be $29 to $32 per acre. This is too high for general use, but not for spot treatment on special areas. Plant succession following treatment is described. Changes are often rapid and favorable. Artificial seeding might speed desired changes. Burning during winter after herbicide treatment removes dead material, creating better conditions for growth of new plants.

Dexter, Ralph W. RECESSION OF EELGRASS AT CAPE ANN, MASSACHUSETTS. Ecology 34(1): 229-231, illus. Jan. 1953.

"Eelgrass patches which had developed in outer Goose Cove during the past 7 years were not present in September, 1952. Possibly they were destroyed when the polluted water impounded in the cove was released upon removal of the temporary dams. On the other hand the eelgrass may have failed through natural causes."

LAND, SOILS, WATER, AND CLIMATE

Bartsch, Paul. 'ILL FARES THE LAND, TO HASTENING ILLS A PREY.' Atlantic Naturalist 8(4): 168-175, illus. March-April 1953.

Gives many facts on the financial and other values of our public lands, and on consequences of abuse of such lands. The author considers that it would be suicidal to turn public lands over to private interests for exploitation and destruction. "The problem is not simply whether the wealth of the land shall be used for public or private gain. It is rather whether sound principles for the management of crucial resources shall prevail or whether those resources shall be jeopardized by the destructive greed of a few."

LAND, SOILS, WATER, AND CLIMATE--Continued

Brooks, Charles Ernest Pelham. SELECTIVE ANNOTATED BIBLIOGRAPHY ON CLIMATIC CHANGES. Meteorological Abstracts and Bibliography 1(7): 446-75. 1950. [From Polar Record 6(45).]
"In four sections chronologically; world coverage of books and articles."

Carey, Roy H. THE IMPORTANCE OF INTENSIVE HIGH WATERSHED MANAGEMENT. 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952, Dallas, Texas. 81-85 p. 1952.

Ciriacy-Wantrup, S. von. RESOURCE CONSERVATION: ECONOMICS AND POLICIES. University of California Press, Berkeley. 395 p. 1952. $6.50. [From review by E. V. Zumwalt, Journal of Forestry 51(2).]
Primarily a treatise on the economics of conservation and on how desired policies can be applied legally and practically. Examples are taken from many fields. "The book neither includes a history of conservation nor methods of conservation practice. Emphasis is placed on an analysis of economic and institutional forces affecting conservation decisions and principles applicable to policy implementation." [See also E. H. Graham's informative review in Jour. Wildl. Mgt. 17(2): 231-232.]

Clawson, Marion. UNCLE SAM'S ACRES. Dodd, Mead and Co., N. Y. 391 p., illus. 1951. $5.00. [From review by G. E. Weaver, Journal of Range Management 4(6).]
The former head of the Bureau of Land Management discusses the history and administration of U. S. public lands. Some of the subjects treated are the clumsiness of government legislative and administrative procedure, competition between agencies, fostering and use of pressure groups, multiple use of public lands and reconciliation of conflicts that arise because of it.

Dresser, Cleveland van. THE FOREST LAND "STEAL." Nature Magazine 46(2): 90-92, 108, illus. Feb. 1953.

Dresser, Cleveland van. ABUSES UNDER THE MINING LAWS: PROFITEERING WITH IMPUNITY. American Forests 59(3): 9, 30-31, cartoon. March 1953.
Last of 6 articles describing the mining claim hoax being worked on federal forest lands under antiquated legislation.

Gieseker, L. F., and others. SOIL SURVEY (RECONNAISSANCE) OF CENTRAL MONTANA. U. S. Soil Conservation Service, Series 1940, no. 9. 1-133 p., illus. Feb. 1953. $1.25 from Superintendent of Documents.
Describes a 10-county area and its many soil types. Includes 2 large folding maps.

Hasty, A. H., and others. SOIL SURVEY OF LIMESTONE COUNTY, ALABAMA. U. S. Soil Conservation Service, Series 1941, no. 5. 1-140 p., illus., including large folding maps. March 1953. Price not stated. Order from Superintendent of Documents, Washington 25, D. C.

Haymes, Lon S. BASIC LAWS AS THEY AFFECT WATER OWNERSHIP AND USE. 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952, Dallas, Texas. 44-50 p. 1952.

Johnson, Maxwell O. CYCLES IN WEATHER AND SOLAR ACTIVITY. Paradise of the Pacific Press, Honolulu, Hawaii. 224 p., tables and graphs. 1950.

Leahy, Dave. REPORT OF NATIONAL WATER POLICY COMMITTEE. 42nd Convention of the International Association of Game, Fish and Conservation Commissioners, Sept. 11-12, 1952, Dallas, Texas. 27-29 p. 1952.

LAND, SOILS, WATER, AND CLIMATE--Continued

Leighty, W. J., and C. E. Wyatt. SOIL SURVEY OF GRAVES COUNTY, KENTUCKY. U. S. Bureau of Plant Industry, Soils, and Agricultural Engineering, Series 1941, no. 4. 1-139 p., illus. Jan. 1953. $2.25 from Superintendent of Documents.
Includes description of county and several large maps.

Morgan, Arthur E. THE MIAMI CONSERVANCY DISTRICT. McGraw-Hill, N. Y. xiii + 504 p. 1951. $6.50. [From review by H. E. Pintler, California Fish and Game 39(2).]
Dayton, Ohio, was nearly wiped out by the 1913 flood of the Miami River. Nine years later a thoroughly planned flood control program was in effect. In the meantime many technical, legal, and personal problems had to be solved. The chief engineer tells in this book just how the whole project was managed, emphasizing the public relations problems that are common to all conservation projects. His approach to these matters should interest other conservation leaders. "Only through a combination of dynamic leadership, honest social cooperation and democratic action was the plan finished and the engineering job completed."

Reuss, Lawrence A., and George T. Blanch. UTAH'S LAND RESOURCES. Utah Agricultural Experiment Station Special Report no. 4. 1-66 p., maps and graphs. June 1951.
Provides much factual and numerical information on land use and ownership in Utah. Maps, tables, and large 3-column pages permit presentation of great amounts of information in the 66 pages. A few of the subjects are: Location of farms and ranches, Major land uses, Special-use areas, Land utilization for recreation, wildlife, and watershed protection, Barren land, Crop yields and range land carrying capacities, Trends in land ownership, Trends in land utilization, and Conservation practices.

Rogers, O. C., and others. SOIL SURVEY, NOBLE COUNTY, INDIANA. U. S. Soil Conservation Service, Series 1940, no. 8. 1-127, illus. April 1953. $2.25 from Superintendent of Documents.
It is worth remembering that these soil surveys provide much information on subjects other than soils and have large maps of varied uses. For many areas, soil survey papers probably provide the best available background.

Ross, Terry. THE VALLEY THAT SMILED AGAIN. Natural History 61(6): 248-256, illus. June 1952.
Good popular account of the famous and successful Brandywine Valley (Pa. and Del.) program of soil and water conservation. Tells how this project, which now serves as a model for others, was organized and put across.

Sawyer, Robert W. THE WHOLE STORY. American Forests 59(3): 10-12, 39, illus. March 1953.
Points out fallacies and half truths in propaganda attacks on federal land ownership, particularly those attacks that claim financial loss to the state or community.

Stallings, J. H. ABSTRACTS OF RECENT PUBLISHED MATERIAL ON SOIL AND WATER CONSERVATION. U. S. Soil Conservation Service PA-192. 75 p. Dec. 1951. [From Journal of Range Management 5(4).]

Timmons, John F., and William G. Murray, editors. LAND PROBLEMS AND POLICIES. Iowa State College Press, Ames. viii + 298 p., illus. 1950. $4.00. [From review by C. E. Poulton, Journal of Range Management 4(6).]
Recommended by Poulton as a stimulating work on land use policy and land economics. It consists of 15 papers by as many well-known authorities. The book progresses from statements of principles and objectives in land utilization to discussions of specific uses. Among the subjects treated by specialists are farm lands, range lands, water resources, forestry, recreation, and wildlife. The concluding chapter summarizes the papers and makes suggestions for the development of improved land policy as basis for integrated action programs.

LAND, SOILS, WATER, AND CLIMATE--Continued

Waksman, Selman A. SOIL MICROBIOLOGY. John Wiley & Sons, N. Y. 16, N. Y. 356 p., illus. 1952. $6.00. [From review by S. A. Wilde, Journal of Forestry 51(2).]
Excellent reference or college text by a distinguished authority.

Westermann, J. H. CONSERVATION IN THE CARIBBEAN. A REVIEW OF LITERATURE ON THE DESTRUCTION AND CONSERVATION OF RENEWABLE NATURAL RESOURCES IN THE CARIBBEAN AREA, WITH REFERENCE TO THE POPULATION PROBLEM. Publications of the Foundation for Scientific Research in Surinam and the Netherlands Antilles (Utrecht) no. 7. 1-121 p. Aug. 1952.
Provides a factual, thoughtful review of soil, agricultural, forestry, population, and conservation education problems and what is being done about them in different areas. Destructive practices and overpopulation are characteristic and extremely serious. At the present rate the population will double in 35 years, though the present population scarcely can be supported. Needed are population control, land use planning, conservation education, and in some places, new systems of land tenure. Bibliography of 258 selected references.

Yale Conservation Club. YALE CONSERVATION STUDIES 1(1): 1-84, graphs. May 1952.
Twelve papers prepared chiefly by graduate students in conservation at Yale University. These papers naturally vary in length and substance, but most of them are intended as essays on basic philosophy of problems, rather than as reports of research studies. Titles reflect the breadth of the Yale conservation program: Conserving the Intangibles. The Natural History of Resource Managers. Two Notes on the Attitude of Farmers. The Promotion of Good Forestry on Private Woodlots. A Look at Demography. Panel Panorama. Sewage Sludge as Potential Fertilizer in the United States. Wildlife and the Sportsman's Attitude. The Response of the American Indian to Our Civilization. The Conservation of Property. The Outdoor Public--An Unexploited Educational Resource. Conflicts of Interest in Conservation.

Yale Conservation Club. YALE CONSERVATION STUDIES 2(1): 1-100 p., illus. 1953. $1.00 from Yale Conservation Program, 77 Prospect St., New Haven, Conn.
Consists of 14 essays that vary from aesthetic to practical. These papers are not research reports, but are sincere discussions of difficult or controversial problems. Most of the authors are or were Yale conservation students. Titles are: "Something Amiss in the National Parks" by Paul Shepard, Jr. "Land Reclamation with Alluvial Fill" by Harry Doehne. "Protecting the Watershed, a Community Job" by Gordon Loery. "'What is Your Business Then, O ye Sent Ones?'" by G. E. Huntington. "The Small Farmer and Soil Conservation" by Jane Collier. "The Effect of Population Growth and Rising Levels of Living on Resource Drain" by Robert Teeters. "Some Remarks on Natural Areas" by R. L. Perkins, Jr. "Comments on the New York State Forest Preserve Situation" by Oakleigh Thorne, II. "Art and the Conservationist" by Gordon Loery. "Ecology, the Poetry of Science" by Susannah Coolidge. "Predicting Growth Potential in Beef Cattle" by Owen Beenhouwer. "Culture and Technical Assistance" by C. F. Jones. "A Layman from Nigeria Looks at Conservation" by F. P. Cobb. "An Ecological View of Land-Use in Latin America" by Paul B. Sears.

AVAILABILITY OF PAPERS

of Southeastern Association of Game and Fish Commissioners. Mr. James H. Jenkins, School of Forestry, University of Georgia, Athens, can supply copies of many of the papers of the 1952 meeting and some from the 1951 and 1950 meetings. Sets that are as nearly complete as possible will be sent to libraries requesting them. Individuals should specify the papers or fields in which they are interested. The Southeastern Association is referred to informally as the Southeastern Wildlife Conference, and some of the papers are so headed.

AUTHOR INDEX

	Page
Ahlgren, H. L.	83
Albertson, F. W.	82
Allen, Ralph	64
Allen, Robert P.	72
Anderson, Roy C.	39
Arbib, Robert S., Jr.	72
Arnold, David A.	22
Arnold, Joseph F.	79
Ash, C. E.	50
Ashbrook, Frank G.	38
Atkeson, Thomas Z.	32
Austin, Oliver L., Sr.	53
Bailey, Norman T. J.	5
Baker, Harold L.	79
Baker, Maurice F.	63
Ball, Robert C.	21
Ball, Stanley C.	53
Banks, Wayne C.	82
Barber, Harold L.	36
Barber, Yates M., Jr.	65,83
Barbour, Roger W.	9
Barkalow, Frederick S., Jr.	33
Barker, Elliott S.	12
Barnes, Wm. B.	63
Barron, William Darlington	45
Barth, Edvard K.	52
Bartholomew, George A., Jr.	74
Bartsch, Paul	83
Baskett, Thomas S.	18
Beall, Geoffrey	5
Bednarik, Karl	66
Beidleman, Richard G.	28
Bell, Julia	7
Bellrose, Frank C.	67
Benson, Seth B.	37
Bent, Arthur Cleveland	72
Benton, Allen H.	38
Berard, Edward V.	4
Bertram, E. Cooper	36
Bertram, George Colin Lawdor	50
Biber, S. H.	75
Biggs, J. A.	12
Biswell, H. H.	19,20
Blagbrough, H. P.	11
Blair, W. Frank	29,33
Blaisdell, James P.	82
Blake, Charles H.	52,67
Blake, Emmet Reid	56
Blanch, George T.	85
Bleakney, Sherman	74
Blouch, Ralph I.	61
Blyth, J. D. M.	50
Boldt, Wilbur	18
Borg, Karl	57
Bowman, Nathaniel Robert	40
Boyles, James H.	74
Brandly, C. A.	31
Brazda, Arthur R.	43
Breckenridge, Walter J.	67
Breland, Osmond P.	8
Britton, Max Edwin	79
Brohn, Allen	37
Brooks, Charles Ernest Pelham	84
Brooks, Maurice	52
Brown, C. J. D.	21
Brownlow, H. G.	52
Bullock, Wilbur L.	58
Bundren, John	10
Burnet, Frank MacFarlane	32
Burns, Marca	41
Burt, William Henry	29
Buxton, Frank Edwin	46
Cade, Tom J.	72
Cahoon, Willie G.	67
Calhoun, John B.	30
Calvin, Jack	10
Carey, Roy H.	84
Carl, G. C.	9
Carpenter, Charles C.	74
Carter, Glen David	61
Cartwright, B. W.	67
Casey, Ivan	24
Chapman, Douglas G.	5
Chapman, Oscar L.	24
Chatfield, Paul O.	36
Cheatum, E. L.	44,46
Chermock, Ralph L.	74
Chernin, Eli	58
Chisholm, A. H.	52
Chitty, Dennis	6
Christian, John C.	28
Ciriacy-Wantrup, S. von	84
Clarke, J. R.	33
Clawson, Marion	84
Clemens, W. A.	10
Coats, James Lee	63
Cochran, Rod	40
Cockrum, E. Lendell	33,34
Coffin, A. Lynn	43
Collins, Stephen	3
Colls, D. G.	42
Colquhoun, M. K.	65
Conard, Henry S.	78
Conaway, C. H.	29
Connor, Paul F.	30
Conroy, K. E.	29
Cooper, Harold W.	82
Core, Earl L.	79
Corthell, Robert Ashley	61
Costa, Robert Richard	39
Cott, Hugh B.	53
Cottam, Clarence	2,11,12,21,46
Couey, Faye	43
Coulter, Malcolm W.	30
Cowan, I. McT.	12
Cox, E. L.	5
Crafts, A. S.	77
Crane, Harold S.	42,46
Cruzado, H. J.	77
Cunningham, R. W.	4

	Page
Curtis, J. T.	83
Curtis, James D.	33
Cypert, Eugene, Jr.	12
Dahlgren, Robert B.	65
Dahlka, Kenneth J.	68
Daniels, T. W. "Bill"	43
Day, Albert M.	13
DeBoer, Stanley G.	46
DeGarmo, W. R.	46
Deitschman, Glenn H.	79
Denney, Richard N.	37
Dessauer, Herbert C.	75
Dexter, Ralph W.	83
Dice, Lee R.	10
Dozier, Herbert L.	38
Drahos, Nick	66
Dreis, Robert Edward	67
Dresser, Cleveland van	21,84
Dumont, Philip A.	46
Durell, James S.	18
Dushinske, Russ	68
Eadie, W. Robert	34
Eads, R. B.	10
Eberhardt, Lee	47,61
Eckles, T. V.	13
Edwards, Malcolm G.	19
Edwards, R. Y.	43
Egler, Frank E.	77
Ehrenberg, Myron	81
Ekman, Sven	10
Elderton, E. M.	7
Elkins, W. A.	13
Elliott, Jack Calkins	80
Elliott, John J.	72
Elton, N. W.	75
Engels, William L.	54
English, P. F.	20
Erickson, Arnold B.	71
Eschmeyer, R. W.	3
Evans, Everett F.	36
Evans, Florence L.	34
Everhart, W. Harry	76
Eyster, Marshall Blackwell	53
Farner, Donald S.	53
Fichter, Edson	20
Findley, James S.	30
Fishel, Charles W.	44
Fisher, James	57,72
Fisher, Ralph A., Sr.	43
Fitch, John E.	77
Fitch, Kenneth L.	33
Fitz Patrick, James L.	53,54
Fitzwater, William D., Jr.	35
Flyger, V. F.	48
Ford, Corey	13
Ford, J. H.	12
Ford, John R.	21
Fosburgh, P. W.	17
Fowle, C. David	13,20
Fowler, Henry W.	76
Francine, Jock	32
Franey, Edward M.	40
Freeman, H. W.	76
Friauf, James J.	77
Frye, Thos. D.	13
Gabrielson, I. N.	14
Galbreath, Donald S.	63
Gale, Larry R.	11,17
Garrett, H. U.	31
Gault, William L.	36
Geis, Aelred D.	5,73
Gieseker, L. F.	84
Gilfillan, Merrill C.	46
Gill, E. R.	4
Ginn, Wm. E.	3
Glading, Ben	14
Glassen, Harold W.	14
Glazener, W. C.	11
Gleason, Henry A.	78
Glover, Fred A.	68
Good, Ernest Eugene	73
Gooden, Samuel K.	60
Goodrum, Phil	60
Goodwin, M. H., Jr.	58
Gordon, Robert D.	5
Gordon, Seth	14,25
Gorham, J. R.	40
Greeley, Frederick	71
Green, Dorr D.	22
Greenhalgh, Clifton M.	59
Gregg, R. F.	7
Griffin, Donald R.	9
Griffiths, H. J.	40
Griswold, John A.	52
Grondahl, C. R.	31,61
Grundy, P. M.	5
Guiguet, C. J.	9
Gullion, Gordon W.	71
Gutermuth, C. R.	14
Haartman, Lars von	57
Hacker, H. P.	5
Hagen, Herbert L.	46
Hagen, Yngvar	54
Hall, E. Raymond	29,34
Hall, William B.	8
Hamilton, W. J., Jr.	34
Hammond, John, Jr.	9
Hansen, Charles Goodman	61
Hansen, Henry A.	68
Hanson, Harold C.	52,58,68
Hanson, Herbert C.	44,78
Hardy, G. A.	9
Hardy, J. E.	12
Harkness, W. J. K.	3
Harlan, Charles F.	51
Harlan, James R.	47
Harned, B. K.	4
Harper, Arthur R.	32
Harper, Francis	57
Harris, R. S.	14
Harris, Stanley W.	61
Hart, J. Sanford	34
Harvey, Julian C.	60
Hasty, A. H.	84

	Page
Hatter, J.	42
Haugen, Arnold O.	47
Haymes, Lon S.	84
Hayne, Don W.	47
Heath, G. R.	4
Hedgpeth, Joel W.	10
Hediger, H.	30
Hedrick, D. W.	19
Heinemann, Eric G.	56
Heller, V. G.	10
Hendricks, Stanley L.	31
Hendrickson, George O.	32
Herman, Carlton M.	66
Herndon, Paul	60
Hickey, Joseph J.	63
Hightower, B. C.	10
Hine, Ruth L.	8
Hjelle, Brandt V.	68
Hodgson, C. W.	82
Hoff, Clayton M.	3
Hoffman, Russell Raymond	61
Hoffmeister, Donald F.	29
Holbrook, Herman L.	65
Holl, Donald G.	20
Hooper, Emmet T.	34
Hopkins, Milton N.	66
Howell, D. E.	10
Howell, J. C.	29
Hubbard, Fred H.	32
Hubbs, Clark	76
Hulse, David C.	32
Humaley, Louis Reams	19
Hunt, George S.	68
Hutchison, S. Blair	80
Irwin, J. C.	7
Irwin, Raymond	52
Isaacs, E.	7
Jameson, Donald A.	82
Janson, Reuel	63
Jellison, William L.	31,44
Jencks, Hugh	21
Jenkinson, J. W.	5
Jenner, Charles E.	54
Jensen, Wallace	42
Johansen, Hans	52
Johnson, Maxwell O.	84
Johnson, Murray L.	30
Johnson, Sherry	30
Jones, Dale A.	42,46
Jones, J. Knox, Jr.	73
Jordan, E. L.	3
Jordan, James S.	68
Julander, Odell	49
Jurgens, Kenneth C.	76
Jutzy, D. A.	75
Karn, M. N.	7
Kawashima, Fumio	35
Keefe, Jim	41
Keefe, Ruth V.	76
Keever, Catherine	80
Kelker, George Hills	5
Kellogg, W. N.	51
Kelson, Keith R.	29,34
Kemp, Paul D.	80
Kendeigh, S. Charles	54
Kerns, Chester M.	47
Kessel, Brina	73
Kibbe, Alice L.	78
Kimball, Thomas L.	14
King, D. B.	80
Kimsey, Alden	38
Kirkpatrick, C. M.	9,23,60
Kittams, Walter H.	44
Klonglan, Eugene D.	61
Knedell, Charles F.	80
Kohler, Robert	51
Kohls, Glen M.	44
Kortlandt, A.	73
Kozicky, Edward L.	61
Kramer, Gustav	54
Kramis, M. J.	44
Krefting, Laurits W.	47,48
Krombein, K. V.	77
Lack, David	57
Lane, Richard D.	79
Larson, Robert W.	80
Latham, Roger M.	47
Latter, Oswald H.	5
Launchbaugh, John L., Jr.	82
Leahy, Dave	84
Lee, Levon	64
Leedy, Daniel L.	2,4
Lehman, V. W.	10
Leighty, W. J.	85
Lemke, Charles W.	59
Leonard, Ross	68
Leopold, A. C.	9
Leopold, A. Starker	55
Leslie, P. H.	5,6
Levine, Norman D.	58
Lewis, Harrison F.	2,15
Lewis, John B.	60
Liers, Emil E.	40
Ligon, J. Stokley	64
Linduska, J. P.	11,69
Linsdale, Jean M.	48
Livingston, M. L.	11
Locker, Betty	44
Longhurst, William M.	48
Longwell, J. R.	48
Love, G. J.	58
Low, Jessop B.	15,69
Lowe, Charles H., Jr.	75
Lowry, E. C.	75
Luvisi, G. W.	77
Lyman, Charles P.	36
Lyon, Jack L.	61
Mabery, Chuck	44
Mace, Robert U.	48
Mackey, James P., Jr.	66
Mackintosh, N. A.	51
MacNamara, Lester G.	19
Madden, Elwood	62
Maebe, J.	69

	Page
Manning, Thomas Henry	57
Marshall, A. J.	55
Martin, Alexander C.	56
Martin, F. R.	48
Martin, P. W.	15
Martin, S. Clark	77,83
Martof, Bernard S.	75
Mathiak, Harold A.	38
Matthews, G. V. T.	55
Mayfield, Harold	73
McAbee, M. L.	37
McCabe, Robert A.	63
McCall, James D.	69
McCullough, Robert	69
McLaughlin, John H.	39
McMillan, John F.	44
Meanley, Brooke	73
Mendall, Howard L.	69
Meschkat, Ray S.	42
Mewaldt, L. R.	53
Middlekauff, W. W.	77
Miller, Loye	55
Milne, Lorus J.	55
Milne, Margery J.	55
Miner, Eugene D.	44
Minner, J. Lester	51
Mirand, Edwin A.	35
Mishin, I. P.	45
Mitchell, R. T.	11
Mizue, Kazuhiro	51
Moessner, Karl E.	4
Moll, T.	31
Montgomery, K. C.	56
Moore, George A.	76
Moore, J. E.	35
Moore, Joseph C.	51,75
Moore, Velma Beam	3
Moran, P. A. P.	6
Moran, Richard	36
Moravets, F. L.	80
Moreau, R. E.	60
Moreland, Raleigh	63
Morgan, Arthur E.	85
Morris, H. N.	51
Morrison, Peter R.	35
Mosby, Henry S.	17
Moses, Harold E.	60
Moynahan, James G.	20
Muchmore, Pete	45
Muesbeck, C. F. W.	77
Müller-Using, D.	15
Mumford, Russell E.	32,69
Murata, Tadashi	51
Murie, Olaus J.	42,45
Murray, William G.	85
Musik, T. J.	77
Myers, Robert H.	17
Nash, John Blake	37
Nasset, E. S.	37
Neff, Johnson A.	73
Negus, Norman C.	30
Nelson, Arnold L.	56
Nelson, Bernard A.	15
Nelson, N. Talmadge	83
Nelson, W. O.	35
Newby, Fletcher E.	40
Nice, Margaret Morse	69
Nicholson, Arnold J.	35
Nielson, R. Lynn	59
Niering, William A.	78
Nishiwaki, Masaharu	51
Oakeson, Barbara Blanchard	56
Odum, Eugene P.	66
Olmstead, R. L.	80
Olson, Harold	73
Orr, Robert T.	51
Overton, W. Scott, Jr.	4
Palmatier, E. A.	21
Parker, K. M.	7
Parker, Kenneth W.	83
Patton, Clyde P.	27
Pearson, H. S.	5,7
Pearson, Karl	6,7
Pearson, Oliver P.	9
Pearson, Paul G.	35
Penny, J. T.	75
Perrin, Emily	6
Peterle, Tony U.	64
Peters, George H.	81
Peters, Harold S.	66
Peterson, Roald A.	77
Petrides, George A.	49
Phelps, Chester F.	17
Pimlott, D. H.	74
Poli, Adon	79
Popov, Boris H.	15
Porsild, A. E.	77
Pough, Richard H.	53
Pound, Charles E.	77
Preston, F. W.	53
Priebe, Margaret Dye	58
Prychodko, W.	36
Quick, Horace F.	29
Quinn, I. T.	14,15
Quiring, D. P.	51
Rainey, Dennis	69
Rand, A. L.	56
Rand, R. W.	51
Rausch, Robert	31
Rawls, Charles K., Jr.	70
Raynor, R. N.	77
Read, Ralph A.	81
Reed, Parker C.	53
Reeves, Maurice C.	60
Reid, Kenneth A.	37
Reid, V. H.	60
Remington, Jack D.	43
Rendel, J. M.	7
Resler, George W.	62
Reuss, Lawrence A.	85
Richards, E. V.	39
Ricker, W. E.	23
Ricketts, Edward F.	10
Riegel, Andrew	82

	Page
Riley, Charles Victor	15
Robb, Dunbar	49
Robbins, W. W.	77
Robinson, J. M.	4
Robinson, Weldon B.	23
Robocker, W. C.	83
Robson, Douglas S.	7
Rodbard, Simon	29
Roedel, Phil M.	76
Rogers, John R.	49
Rogers, O. C.	85
Rose, E. T.	22
Ross, C. Chandler	72
Ross, Terry	85
Rotty, Roland	81
Rounsefell, George A.	76
Rowan, William	7
Royal, Orren L.	31
Ruhl, Harry D.	15
Rutherford, William H.	38
Salter, Robert L.	70
Sanderson, Ivan T.	30
Sawyer, Robert W.	85
Schadle, Albert R.	35
Scheffer, Theo. H.	36
Scheffer, Victor B.	41
Schneider, P. W.	16
Schorger, A. W.	37
Schreiner, Keith M.	19
Schubert, G. H.	35,37
Schultz, A. M.	19,20
Schwartz, Charles W.	66,70
Schwartz, Elizabeth Reeder	66,70
Schwartz, Leonard	16
Scott, D. R. M.	20
Seagears, Clayton B.	3
Sedam, John B.	19
Semple, A. T.	83
Severinghaus, C. W.	49
Sharp, Ward M.	20
Shaub, B. M.	53
Shepherd, W. O.	81
Shoemaker, Carl D.	16
Sieh, James G.	70
Silva, W. J.	14
Sjordal, James	62
Skellam, J. G.	7
Skutch, Alexander F.	56
Smith, Arthur D.	49
Smith, Dwight R.	45
Smith, Eldon H.	65
Smith, Justin G.	49
Smith, Malcolm	2
Smith, Ralph H.	65
Solman, Victor E. F.	3
Southwick, Charles	70
Spencer, Howard E., Jr.	70
Stahnke, Herbert L.	75
Stallings, J. H.	85
Stanz, Harry E., Jr.	62
Steen, M. O.	16
Sterling, Dorothy	81
Stewart, Paul A.	66
Stieve, H.	33
Stiles, Bruce F.	18
Stollberg, Bruce P.	8
Stoner, Dayton	57
Stoner, Lillian C.	57
Strausbaugh, P. D.	79
Stullken, Donald E.	23
Sulman, P. L.	7
Sweatman, Gordon K.	31
Swift, Ernest	16,49
Taber, R. D.	19,50
Tanaka, Ryo	31,35
Tanner, Ward D.	72
Taylor, E. W.	62
Teitz, William J.	35
Tevis, Lloyd, Jr.	23
Thomas, Earl M.	39,41
Thomas, Marjorie	7
Thompson, Donald R.	59
Thompson, Harry V.	33
Thompson, Seton H.	16,51
Thoreson, N. A.	21
Thorpe, W. H.	9
Tiffany, Lewis Hanford	79
Tildesley, M.	7
Timmons, John F.	85
Tiner, Jack D.	35
Titus, Harold	17
Tomich, P. Quentin	48
Townes, H. K.	77
Trimm, Lynn	62
Tyndale-Biscoe, C. H.	33
Tyson, Edwin L.	50
Underwood, Acil B.	39
Van der Vloet, H.	69
Vandeusen, R. D.	48
Van Etten, R. C.	11
Van Gelder, Richard G.	41
Vernberg, F. John	75
Wade, Wilbert Ernest	79
Wagar, J. V. K.	8
Wagner, Fred H.	62
Waksman, Selman A.	86
Walker, Eugene A.	21
Walkinshaw, Lawrence H.	72
Warner, Dwain W.	35
Waters, John	75
Watson, D. M. S.	7
Watson, K. M.	7
Webb, William L.	30
Wente, Carl F.	17
West, G. A.	24
West, T. F.	12
Westermann, J. H.	86
Wheeler, E. P., 2nd.	51
White, Claude E.	7
Whitney, Leon F.	39
Wick, William Quentin	62
Wiese, A. C.	82
Wilke, Ford	52
Wilkin, S. A.	58

	Page
Wilkinson, D. H.	56
Williamson, Leslie A.	59
Wilson, Alvin K.	33
Wilson, H. Lee	4
Wilson, Kenneth A.	40,41
Wing, Leonard W.	7,74
Winters, R. K.	80,81
Witthoft, John	2
Wolf, Bill	18
Wolf, Ken	70
Wolff, E.	7
Wolfson, Albert	56
Wood, John Thornton	76
Wood, R. D.	21
Woodin, William H.	76
Woodruff, N. P.	81
Woolfolk, E. J.	50
Wray, Robert D.	82
Wright, Bruce S.	71
Wright, Thomas J.	62
Wyatt, C. E.	85
Yancey, Richard K.	71
Yeager, Lee E.	4
Yocom, Charles F.	61
Zasada, Zigmond A.	82
Zingg, A. W.	81
Zink, Robert C.	82
Zorichak, John L.	64
Zweifel, Richard G.	75

INT.-DUP. SEC., WASH., D.C. 45105

S